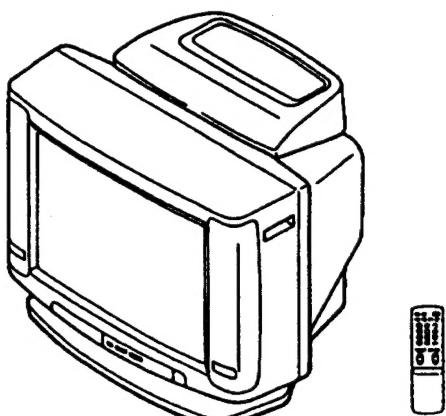


**KV-F29MF1/F29MH11/F29MH31**  
RM-857 RM-857 RM-858

**KV-F29MN11/F29MN31**  
RM-857 RM-858

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## SERVICE MANUAL



### ME Model

**KV-F29MF1** Chassis No. SCC-G37R-A  
**KV-F29MH11** Chassis No. SCC-G37S-A  
**KV-F29MH31** Chassis No. SCC-G37Q-A

### GE Model

**KV-F29MN11** Chassis No. SCC-G44D-A  
**KV-F29MN31** Chassis No. SCC-G44C-A

### HK Model

**KV-F29MF1** Chassis No. SCC-G43J-A  
**KV-F29MH11** Chassis No. SCC-G43K-A  
**KV-F29MH31** Chassis No. SCC-G43D-A

## G3F CHASSIS

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MODELS OF THE SAME SERIES	
KV-F29MF1/F29MH11/F29MH31	
KV-F29MN11/F29MN31	



**TRINITRON® COLOR TV**  
**SONY®**

### SPECIFICATIONS

	KV-F29MN31 KV-F29MH31	KV-F29MN11 KV-F29MH11 KV-F29MF1	Note
<b>Power requirements</b>	110-240 V AC, 50/60 Hz		
<b>Power consumption (W)</b>	169		
<b>Television system</b>	B/G, I, D/K, M		
<b>Color system</b>	PAL, PAL 60, SECAM, NTSC4.43, NTSC3.58		
<b>Stereo system</b>	NICAM Stereo B/G, I; A2 Stereo (German) B/G		except for KV-F29MF1
<b>Channel coverage</b>			
B/G	VHF: E2 to E12/UHF: E21 to E69/CATV: S01 to S03, S1 to S41		
I	UHF: B21 to B68/CATV: S01 to S03, S1 to S41		
D/K	VHF: R1 to R12/UHF: R21 to R60/CATV: S01 to S03, S1 to S41		
M	VHF: A2 to A13/UHF: A14 to A79/ CATV: A-8 to E, G to W+25, W+27 to W+84		
<b>Antenna</b>	75-ohm external antenna terminal for VHF/UHF		
<b>Audio output (speaker)</b>	5W+5W+15W (SUPER WOOFER)	6W × 2	
<b>Number of terminal</b>			
<b>Video</b>	Input: 3	Output: 1	
<b>Audio</b>	Input: 3	Output: 1	
<b>S1-Video</b>	Input: 2		Y: 1 Vp-p, 75 ohms, unbalanced, sync negative C: 0.286 Vp-p, 75 ohms
<b>SUPER WOOFER</b>	Output: 1		
<b>Picture tube</b>	Super Trinitron		
<b>Tube size (inch)</b>	29		Measured diagonally
<b>Screen size (cm)</b>	68		Measured diagonally
<b>Dimensions (w/h/d, mm)</b>	782 × 615 × 540	782 × 593 × 534	
<b>Mass (kg)</b>	52	47	
<b>Accessories</b>			
<b>Supplied</b>	Remote commander (1) Size R6 (AA) battery (2)		
<b>Optional</b>	Magic commander RM-829, RM-848 TV stand SU-F29		

Design and specifications are subject to change without notice.

#### CAUTION

SHORT CIRCUIT THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR CARBON PAINTED ON THE CRT, AFTER REMOVING THE ANODE.

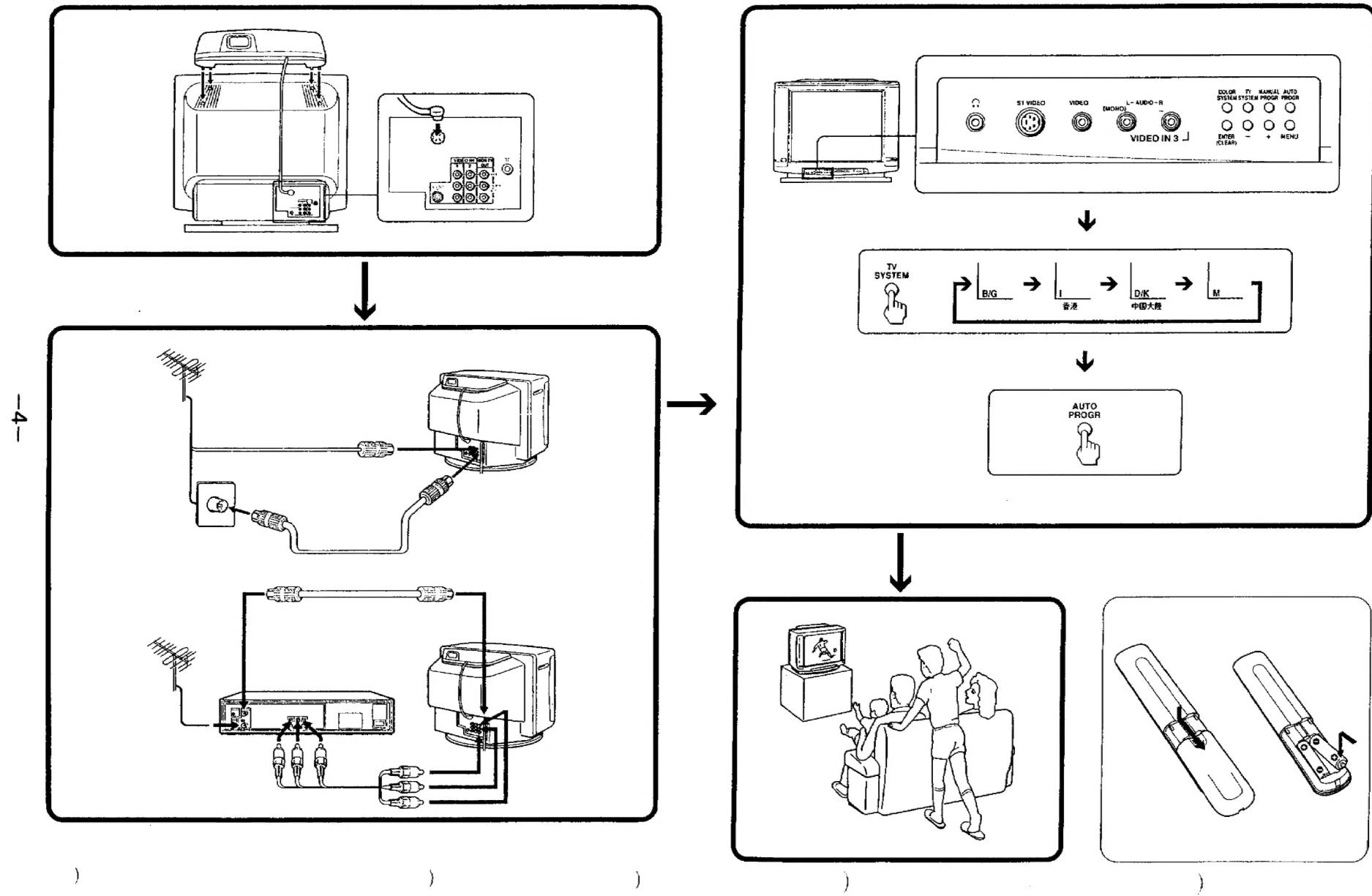
#### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK **▲** ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

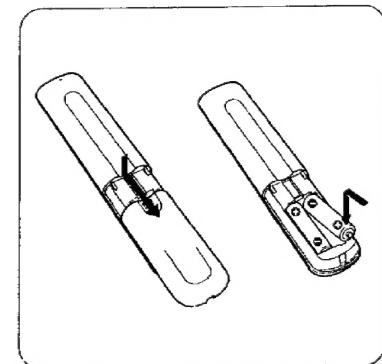
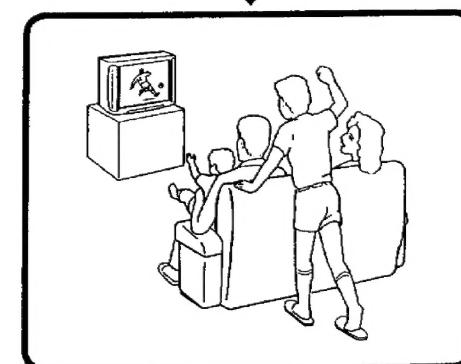
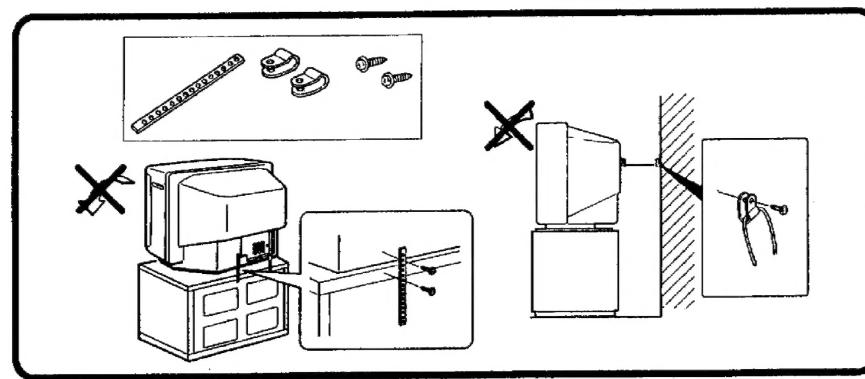
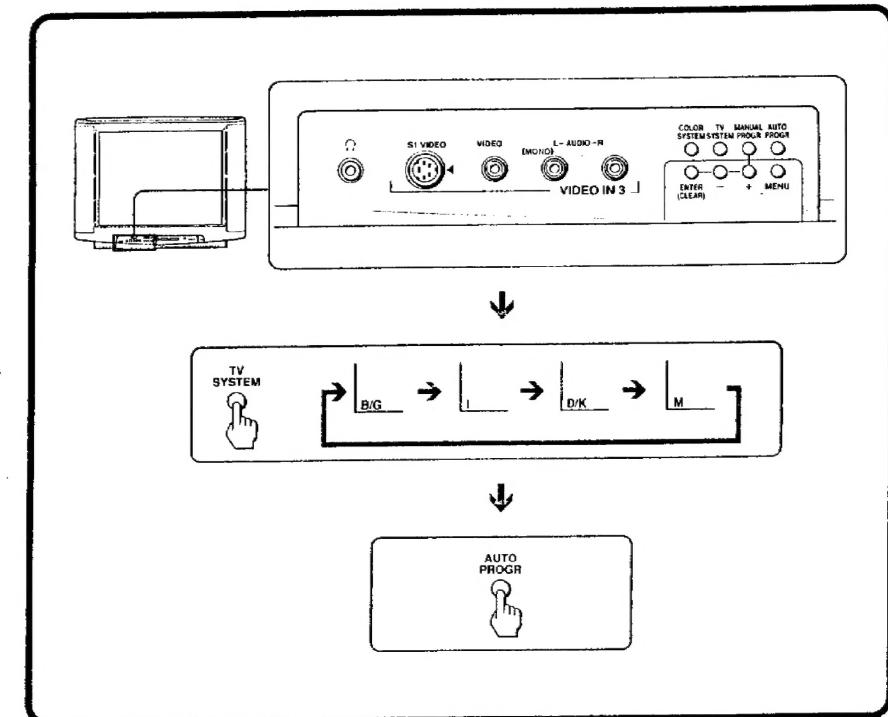
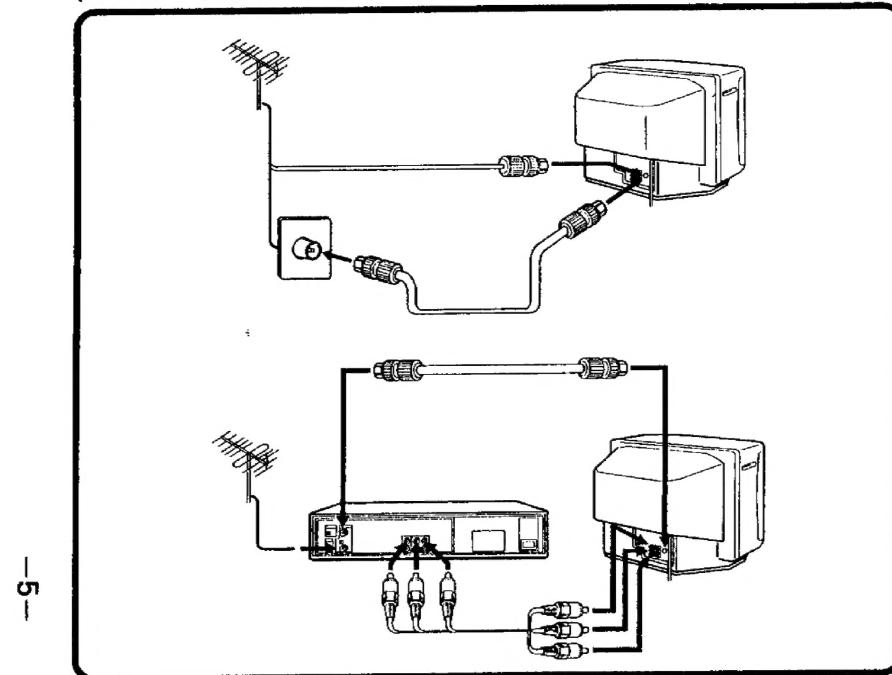
## SECTION 1 GENERAL

(KV-F29MN31, KV-F29MH31)

The operating instructions mentioned here are partial abstracts from the Operating Instruction Manual. The page numbers of the Operating Instruction Manual remain as in the manual.



(KV-F29MN11, KV-F29MH11, KV-F29MF1)

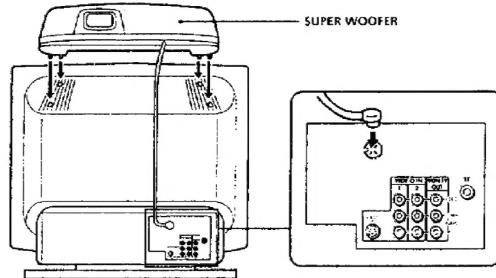


## Connections

### Connecting the SUPER WOOFER (KV-F29MN31, KV-F29MH31 only)

Attach the SUPER WOOFER into the foothold on the top of the TV.

Plug the connector into the SUPER WOOFER (8Ω) terminal at the rear of the TV.



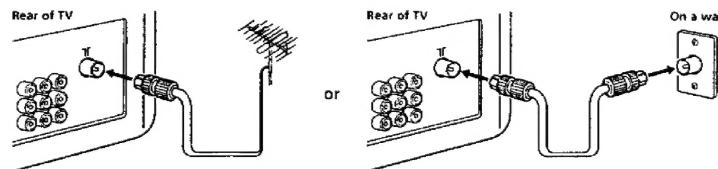
#### Note

- Connect only the supplied SUPER WOOFER; otherwise the TV may malfunction.

### Connecting a VHF antenna or a combination VHF/UHF antenna — 75-ohm coaxial cable (round)

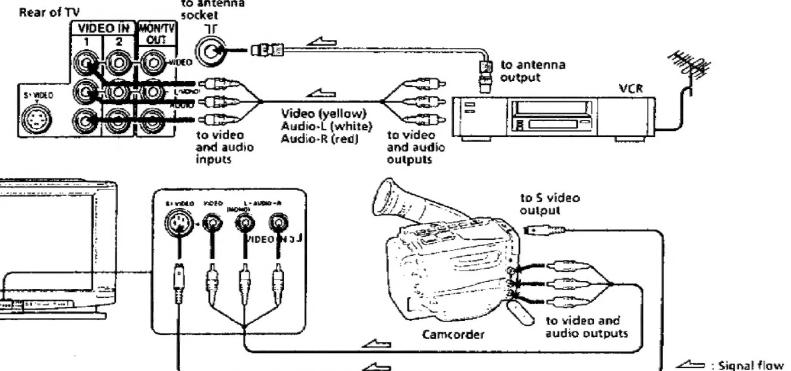
Attach an optional IEC antenna connector to the 75-ohm coaxial cable.

Plug the connector into the T (antenna) socket at the rear of the TV.



### Connecting optional equipment

You can connect optional audio/video equipment to your TV such as a VCR, multi disc player, camcorder, headphones, or stereo system.



#### When connecting a monaural VCR

Connect the yellow plug to VIDEO and the black plug to AUDIO-L (mono).

#### When both S1-Video and video signals are input

The S1-Video input signal is selected. To view a video signal, disconnect the S1-Video connection.

#### Note on the S1-Video signal

When inputting the S1-Video signal through the VIDEO IN 1 or VIDEO IN 3 jack, turn wide mode OFF if you do not want to display the picture in wide mode (see page 19).

#### Note on the video input

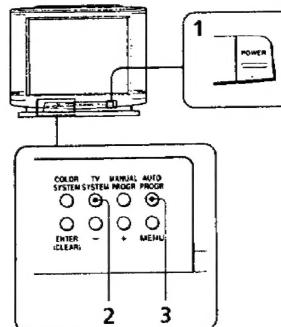
When no signal is input, the screen becomes blue.

## Presetting channels

You can preset TV channels easily by storing all the receivable channels automatically. You can also preset channels manually or disable program positions.

### Presetting channels automatically

You can preset up to 100 TV channels in numerical sequence from program position 1.

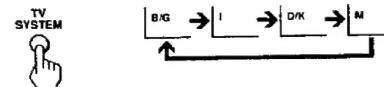


#### 1 Press POWER.

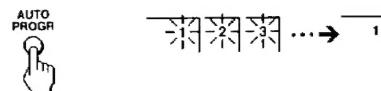


When the TV is in standby mode after pressing POWER, press POWER on the remote commander.

#### 2 Press TV SYSTEM to select your local TV system.



#### 3 Press AUTO PROGR.



#### To start presetting channels automatically from the specified program position

- 1 Press MANUAL PROGR.
- 2 Press TV SYSTEM to select your local TV system.
- 3 Press PROGR +/- to select the program position.
- 4 Press AUTO PROGR.

## Presetting channels manually

To change the program position for a channel or to receive a channel with a weak signal, preset the channel manually.

#### 1 Press MANUAL PROGR.

#### 2 Press PROGR +/- until the required program position appears on the screen.

#### 3 Press TV SYSTEM to select your TV system.

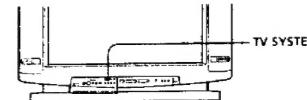
#### 4 Press + or - until the required channel picture appears on the screen.

#### 5 Press MANUAL PROGR.

#### If the TV system is not properly selected

The color of the picture may be poor and/or the sound may be noisy. In this case, select the appropriate TV system.

- 1 Press PROGR +/- to select the program position.
- 2 Press TV SYSTEM until the picture and sound become normal.



#### Note

- The setting of the TV SYSTEM is memorized for each program position.

## Disabling program positions

By disabling unused or unwanted program positions, you can skip those positions when you press PROGR +/-.

#### 1 Press PROGR +/- until the unused or unwanted program position appears on the screen.

#### 2 Press MANUAL PROGR.

#### 3 Press ENTER (CLEAR) on the TV.

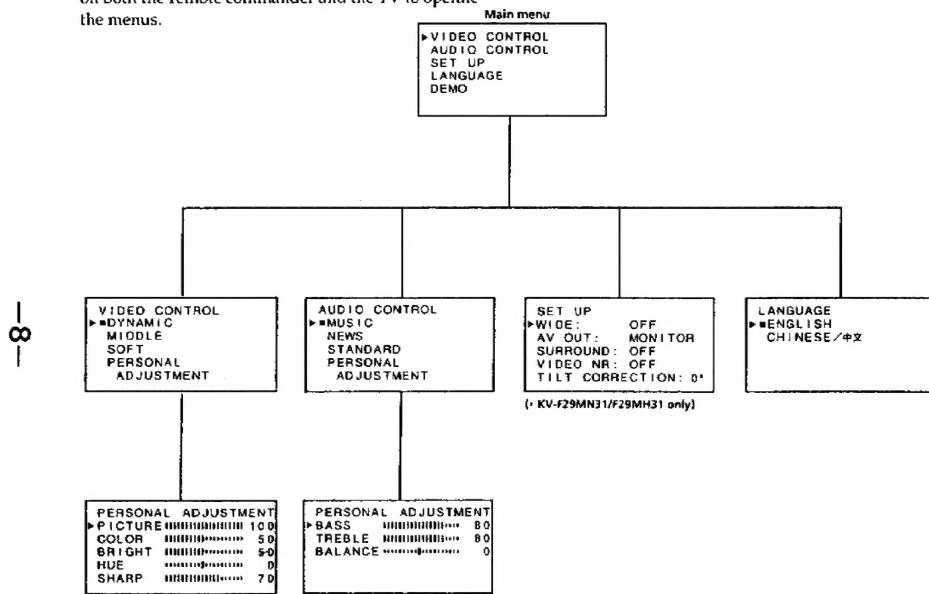
#### 4 Press MANUAL PROGR.

#### To cancel the skip setting

Preset the channel manually or automatically again.

## Introducing the menu

You can use the on-screen menus to set the picture quality, sound, and other settings. You can use buttons on both the remote commander and the TV to operate the menus.



### Getting back to the previous menu

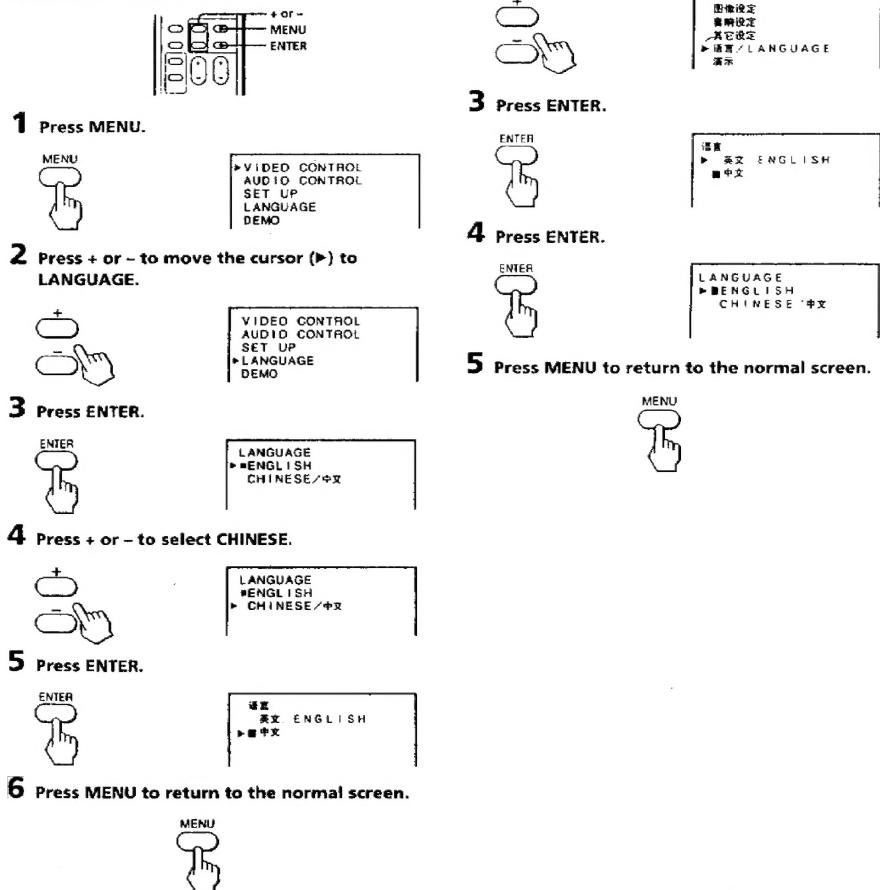
Move the cursor (>) up to the first line of each menu (except the main menu), and press ENTER.

#### Notes

- If more than 60 seconds elapse after you press a button, the menu screen disappears automatically.
- You can display all of the features available for the TV in DEMO mode.

## Changing the menu language

If you prefer Chinese to English, you can change the menu language. You can use buttons on both the remote commander and the TV.



### Getting back to the English menu

1 Press MENU.



▶ 图像设定  
音响设定  
其它设定  
语言 / LANGUAGE  
演示

2 Press + or - to move the cursor (>) to the fourth line from the top ("语言/LANGUAGE").



图像设定  
音响设定  
其它设定  
▶ 语言 / LANGUAGE  
演示

3 Press ENTER.



语言  
▶ 英文 ENGLISH  
■ 中文

4 Press ENTER.



LANGUAGE  
▶ ENGLISH  
CHINESE / 中文

5 Press MENU to return to the normal screen.

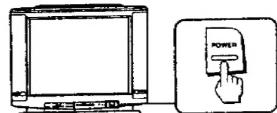


MENU

## Operations

### Watching the TV

#### 1 Press POWER to turn the TV on.

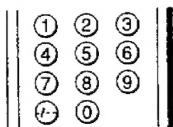


When the TV is in standby mode after pressing POWER, press POWER on the remote commander.

#### 2 Select the TV channel you want to watch.

##### To select a channel directly

Press a number button.



To select a two-digit channel, press “-/-” before the number buttons.

For example: to select channel 25, press “-/-”, and then “2” and “5.”



##### To scan through channels

Press PROGR/PAGE +/- until the channel you want appears.

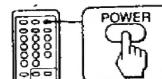


#### 3 Press VOL +/- to adjust the volume.



### Switching off the TV

To switch off the TV temporarily, press POWER on the remote commander.

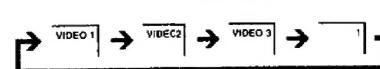
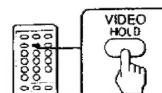


To switch off the TV completely, press POWER. If the power on the TV is turned off in standby mode, the STANDBY indicator may remain alight for a while.

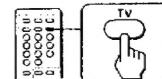


### Watching the video input

#### Press VIDEO/HOLD.

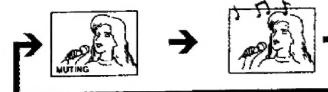
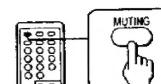


#### To watch TV, press TV.

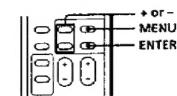


### Muting the sound

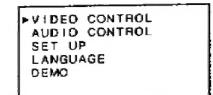
#### Press MUTING.



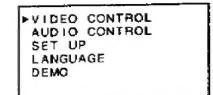
### Adjusting the picture



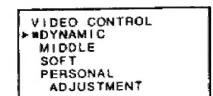
#### 1 Press MENU.



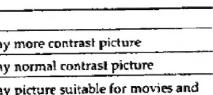
#### 2 Press + or - to move the cursor (►) to VIDEO CONTROL.



#### 3 Press ENTER.



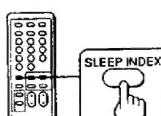
#### 4 Press + or - to select the setting, and press ENTER.



### Setting the Sleep Timer

You can set the TV to turn off automatically after the period of time you set.

#### Press SLEEP/INDEX.



To cancel the Sleep Timer, press SLEEP/INDEX repeatedly until “SLEEP OFF” appears, or turn the TV off.

#### 5 Press MENU to return to the normal screen.

### Adjusting the picture setting (ADJUSTMENT)

You can adjust the picture to your own taste with the ADJUSTMENT option. The adjusted settings are stored in the PERSONAL option.

- 1 Press MENU.
- 2 Press + or - to move the cursor (>) to VIDEO CONTROL, and press ENTER.
- 3 Press + or - to move the cursor (>) to ADJUSTMENT, and press ENTER.
- 4 Press + or - to move the cursor (>) to the item you want to adjust, and press ENTER.

PERSONAL ADJUSTMENT	
PICTURE	100
COLOR	50
BRIGHT	50
HUE	0
SHARP	70

- 5 Press + or - to adjust the item, and press ENTER.

Item	Press + to	Press - to
PICTURE	Increase picture contrast	Decrease picture contrast
COLOR	Increase color intensity	Decrease color intensity
BRIGHT	Brighten the picture	Darken the picture
HUE	Make skin tones become greenish	Make skin tones become reddish
SHARP	Sharpen the picture	Soften the picture

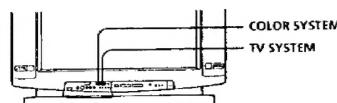
- 6 To adjust other items, repeat steps 4 and 5.
- 7 Press MENU to return to the normal screen.

#### Note

• You can adjust HUE for NTSC color system only.

### If the color of the picture is abnormal

When receiving programs through the  $\text{TF}$  terminal: Press TV SYSTEM or COLOR SYSTEM until the color becomes normal.

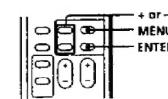


#### Note

• Normally set COLOR SYSTEM to AUTO.

### Adjusting the sound setting (ADJUSTMENT)

When receiving programs through the  $\text{TF}$  terminal: Press TV SYSTEM until the sound becomes clear.



- 1 Press MENU.



▶ VIDEO CONTROL
▶ AUDIO CONTROL
SET UP
LANGUAGE
DEMO

- 2 Press + or - to move the cursor (>) to AUDIO CONTROL.



▶ VIDEO CONTROL
▶ AUDIO CONTROL
SET UP
LANGUAGE
DEMO

- 3 Press ENTER.



▶ AUDIO CONTROL
▶ MUSIC
NEWS
STANDARD
PERSONAL
ADJUSTMENT

- 4 Press + or - to select the sound that you want, and press ENTER.

Select	To
MUSIC	Listen to music programs.
NEWS	Listen to news program. A person's voice can be heard clearly.
STANDARD	Listen to sound other than music or news.
PERSONAL	Listen to the sound that is adjusted using ADJUSTMENT.
ADJUSTMENT	Make specific settings. See "Adjusting the sound setting."

- 5 Press MENU to return to the normal screen.

### Adjusting the sound setting (ADJUSTMENT)

You can adjust the sound to your own taste with the ADJUSTMENT option. The adjusted settings are stored in the PERSONAL option.

- 1 Press MENU.
- 2 Press + or - to move the cursor (>) to AUDIO CONTROL, and press ENTER.
- 3 Press + or - to move the cursor (>) to ADJUSTMENT, and press ENTER.
- 4 Press + or - to move the cursor (>) to the item you want to adjust, and press ENTER.

PERSONAL ADJUSTMENT	
BASS	80
TREBLE	80
BALANCE	0

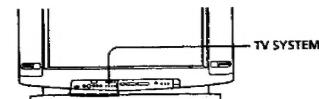
- 5 Press + or - to adjust the item, and press ENTER.

Item	Press + to	Press - to
BASS	Increase the bass sound	Decrease the bass sound
TREBLE	Increase the treble sound	Decrease the treble sound
BALANCE	Increase the volume of right speaker	Increase the volume of left speaker

- 6 To adjust other items, repeat steps 4 and 5.
- 7 Press MENU to return to the normal screen.

#### If the sound is distorted or noisy

When receiving programs through the  $\text{TF}$  terminal: Press TV SYSTEM until the sound becomes clear.



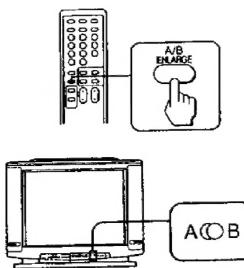
(except for KV-F29MF1)

## Selecting a stereo or bilingual program

You can enjoy stereo sound or bilingual program of NICAM and A2 (German) systems. The initial setting is stereo sound.

**Press A/B/ENLARGE repeatedly until you receive the sound you want.**

The sound changes and the corresponding indicator lights up as follows:



When receiving a NICAM program:

Broadcasting	On-screen display	Selected sound (indicator)
NICAM stereo	NICAM	→ Stereo → Regular (A and B)
NICAM bilingual	NICAM	→ A → B → Regular (A) (B)
NICAM monaural	NICAM	→ Monaural → Regular (A)

When receiving a A2 (German) program:

Broadcasting	On-screen display	Selected sound (indicator)
A2 (German) stereo	STEREO	Stereo (A and B)
A2 (German) bilingual	—	→ A → B → A+B (A) (B) (A and B)

### Receiving area for NICAM and A2 (German) programs

System	Receiving area
NICAM	Hong Kong, Singapore, New Zealand, etc.
A2 (German)	Australia, Malaysia, Thailand, etc.

#### Notes

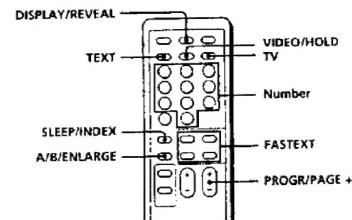
- If the signal is very weak, the sound becomes monaural.
- If the stereo sound is noisy, select "regular" or "mono." The sound becomes monaural, however, the noise will be reduced.

(except for KV-F29MF1)

## Viewing Teletext

TV stations broadcast an information service called Teletext via a TV channel.

Teletext service allows you to receive various information such as weather forecasts or news at any time you want.



### Displaying Teletext

**1 Select a TV channel which carries the Teletext broadcast you want to watch.**

**2 Press TEXT to display the Teletext.**  
A Teletext page is displayed (normally the index page). If there is no Teletext broadcast, P100 is displayed at the top left corner of the screen.

To cancel the Teletext display, press TV.

### Superimposing a Teletext page on the TV picture

**Press TEXT.**  
Each time you press TEXT, the screen changes as follows:

Teletext → Teletext and TV → TV

### Checking the contents of a Teletext service (INDEX)

Press SLEEP/INDEX to display an overview of the Teletext contents and page numbers.

### Using FASTEXT

This feature allows you to quickly access a Teletext page that uses FASTEXT. When a FASTEXT page is broadcast, a color-coded menu appears at the bottom of the screen. The colors of the menu correspond to the RED, GREEN, YELLOW, and CYAN buttons on the remote commander. These color buttons function as the FASTEXT buttons in Teletext mode.

**Press the color button which corresponds to the color-coded menu.**

The page is displayed after a few seconds.

### Selecting a Teletext page

**To input the three-digit page number of the Teletext page, press the number buttons.**  
If you make a mistake, key in the correct page number again.

**To access the next or previous page, press PROGR/PAGE +/-.**

### Holding a Teletext page

A Teletext page may consist of several subpages. You can stop the page scrolling in order to read the text at your own pace.

**Press VIDEO/HOLD.**  
The HOLD symbol "H" is displayed at the top left corner of the screen.

**To resume normal Teletext operation, press TEXT.**

### Revealing concealed information

Sometimes pages contain concealed information, such as an answer to a quiz. The reveal option lets you disclose the information.

#### Press DISPLAY/REVEAL.

To conceal the information, press DISPLAY/REVEAL again.

### Enlarging the Teletext display

#### Press A/B/ENLARGE.

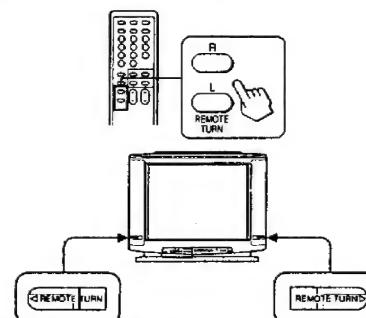
Each time you press A/B/ENLARGE, the Teletext display changes as follows:

Enlarge upper half → Enlarge lower half → Normal size

(KV-F29MN31, KV-F29MH31 only)

## Turning the TV using the remote commander (REMOTE TURN)

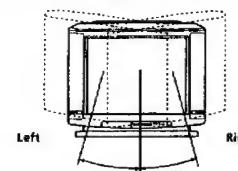
You can turn the TV up to 15 degrees to the left or right (at a total of 30 degrees) using the remote commander.



#### Press R or L of REMOTE TURN.

The TV turns and the REMOTE TURN indicator flashes as follows:

Press	Turning direction	On-screen display	Indicator
R	To the right	REMOTE TURN	Right REMOTE TURN
L	To the left	REMOTE TURN	Left REMOTE TURN



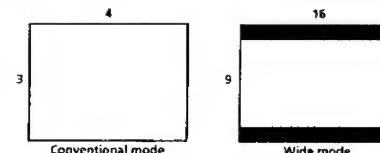
#### Notes

- You cannot turn the TV using the remote commander if the power is turned off.
- Do not turn the TV forcibly as it cannot be turned more than 15 degrees by hand.
- Do not place objects around the TV that obstruct its turning.
- If the picture quality becomes slightly abnormal after using the remote turn, turn off the power of the TV, then turn it on again.

## Customizing the TV (SET UP)

### Turning wide mode

When receiving the signal conforming to wide mode (S1-Video signal), you can change the size of the picture on the screen.



#### 1 Press MENU.

#### 2 Press + or - to select SET UP, and press ENTER.

SET UP  
►WIDE: OFF  
AV OUT: MONITOR  
SURROUND: OFF  
VIDEO NR: OFF

#### 3 Press + or - to select WIDE, and press ENTER.

4 Press + or - to select the wide mode to suit the size of the picture you want to display on the TV screen.

Select	To
ON	Display the picture on the screen in wide mode
AUTO	Display the picture on the screen in wide mode automatically when receiving the S1-Video signal through the S1-Video input jack
OFF	Display the picture on the screen in conventional size

#### Note

- When the picture is in wide mode, the bright lines which are used for adjusting the CRT at optimum level appear at the top of the screen.

### Using the AV OUT (advanced rec-out) terminal

You can select the output signal from the MON/TV OUT jacks at the rear of the TV.

#### 1 Press MENU.

#### 2 Press + or - to select SET UP, and press ENTER.

SET UP  
►WIDE: OFF  
AV OUT: MONITOR  
SURROUND: OFF  
VIDEO NR: OFF

#### 3 Press + or - to select AV OUT, and press ENTER.

Select To  
TV Output the TV signal.  
MONITOR Output the signal of the picture you are watching as a monitor.

#### Note

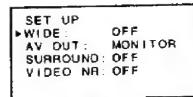
- Do not change the channel while recording with a VCR through the MON/TV OUT jacks. If you change the channel, it also changes the channel you are recording.

### Selecting the surround sound

You can enjoy a surround sound effect that is like being in a music hall when receiving stereo signals.

1 Press MENU.

2 Press + or - to select SET UP, and press ENTER.



3 Press + or - to select SURROUND, and press ENTER.

4 Press + or - to turn the surround sound on or off, and press ENTER.

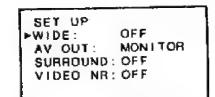
Select	To
ON	Listen to surround sound that is effective for stereo signals
SPACE	Listen to surround sound that is effective for monaural signals
OFF	Turn off surround sound

### Reducing the noise of the picture

You can reduce the noise level of the picture when the TV receives a weak signal or when you play a videotape that is in poor condition.

1 Press MENU.

2 Press + or - to select SET UP, and press ENTER.



3 Press + or - to select VIDEO NR, and press ENTER.

4 Press + or - to turn the noise reduction on or off, and press ENTER.

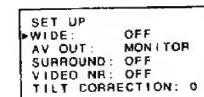
### Adjusting the tilt of the picture

#### ■ KV-F29MN31/F29MH31 only

You can adjust the tilt of the picture if it is not aligned to the TV screen. This may happen due to the direction of the earth's magnetic field in relation to the position of the TV.

1 Press MENU.

2 Press + or - to select SET UP, and press ENTER.



3 Press + or - to select TILT CORRECTION, and press ENTER.

4 Press + or - to select the most suitable value to align the picture position.

TILT CORRECTION: -3 ← -2 ← -1 ← 0 → +1 → +2 → +3

### Additional Information

## Troubleshooting

#### No picture No sound



- Press POWER.
- Check the antenna connection.
- Check the VCR connections.

#### Good picture No sound



- Press VOLUME +.
- Press MUTING.
- Press A/B/ENLARGE.

#### No color



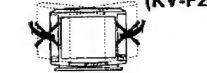
- Adjust the COLOR level in the VIDEO CONTROL menu's ADJUSTMENT option.
- Check the COLOR SYSTEM setting.

#### No sound from SUPER WOOFER (KV-F29MN31, KV-F29MH31 only)



- Check the connection of the SUPER WOOFER.

#### Remote turn does not function.



- Check that the stopper located at the swivel (rear of the TV) is removed.

#### TV cabinet creaks

- Even if the picture or the sound is normal, changes in the room temperature sometimes make the TV cabinet expand or contract, making a noise. This does not indicate a malfunction.

#### Good picture Noisy sound

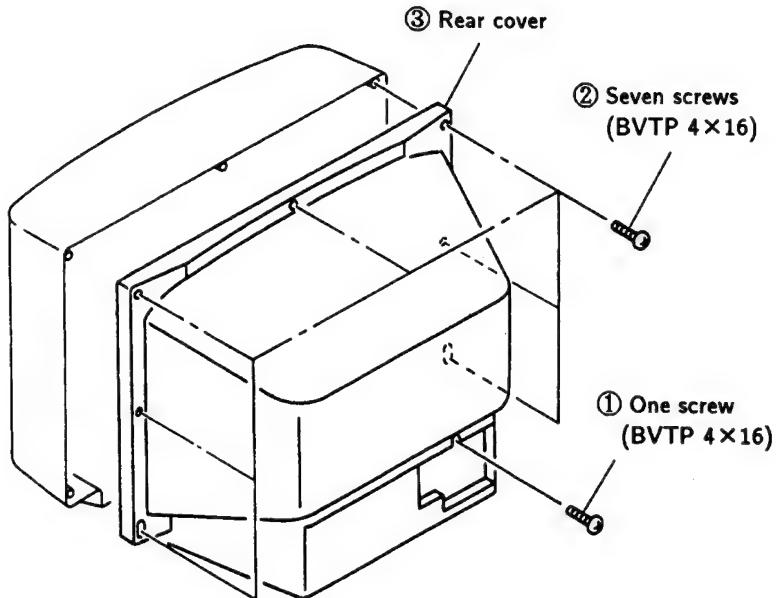


- Check the TV SYSTEM setting.

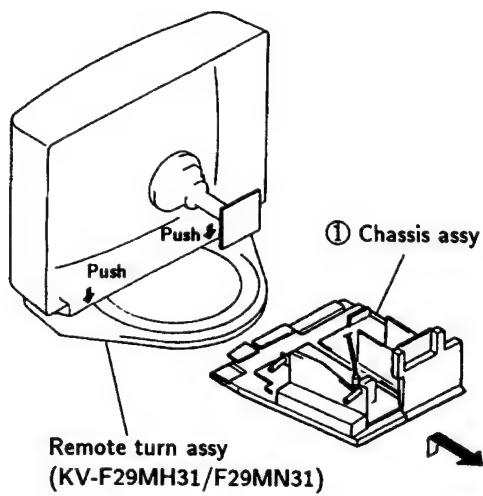
KV-F29MF1/F29MH11/F29MH31  
RM-857 RM-857 RM-858  
KV-F29MN11/F29MN31  
RM-857 RM-858

## SECTION 2 DISASSEMBLY

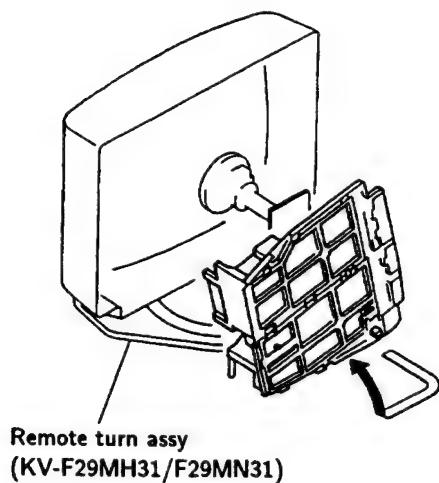
### 2-1. REAR COVER REMOVAL



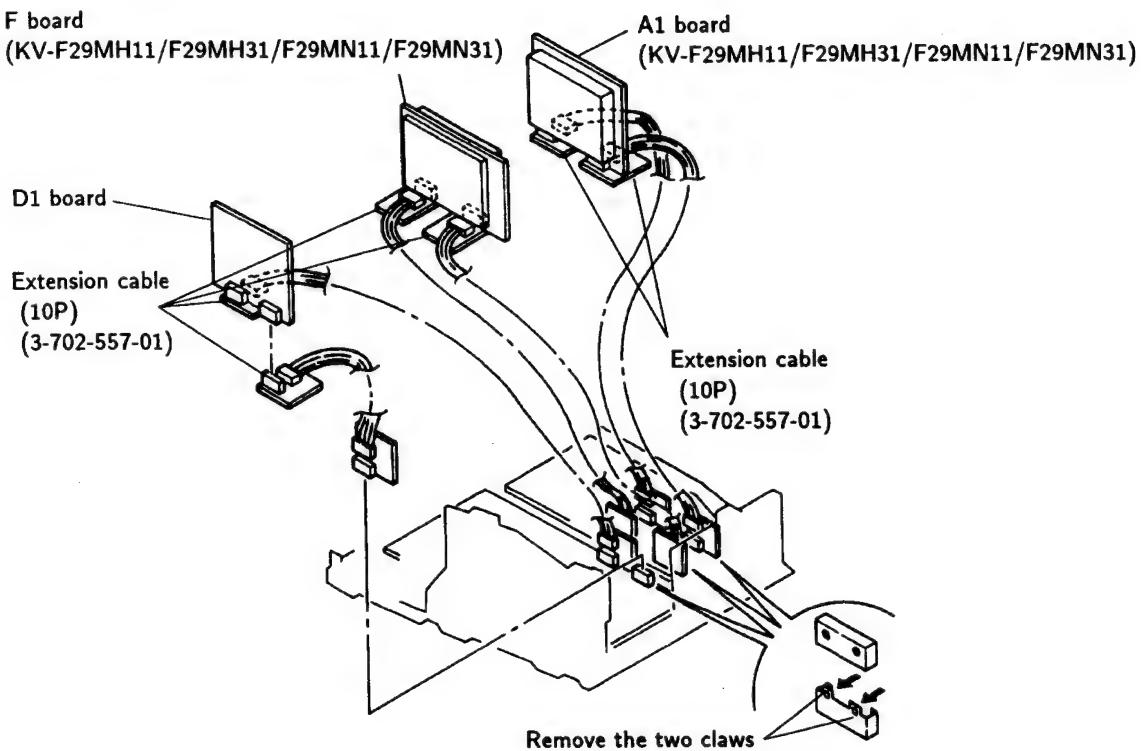
### 2-2. CHASSIS ASSY



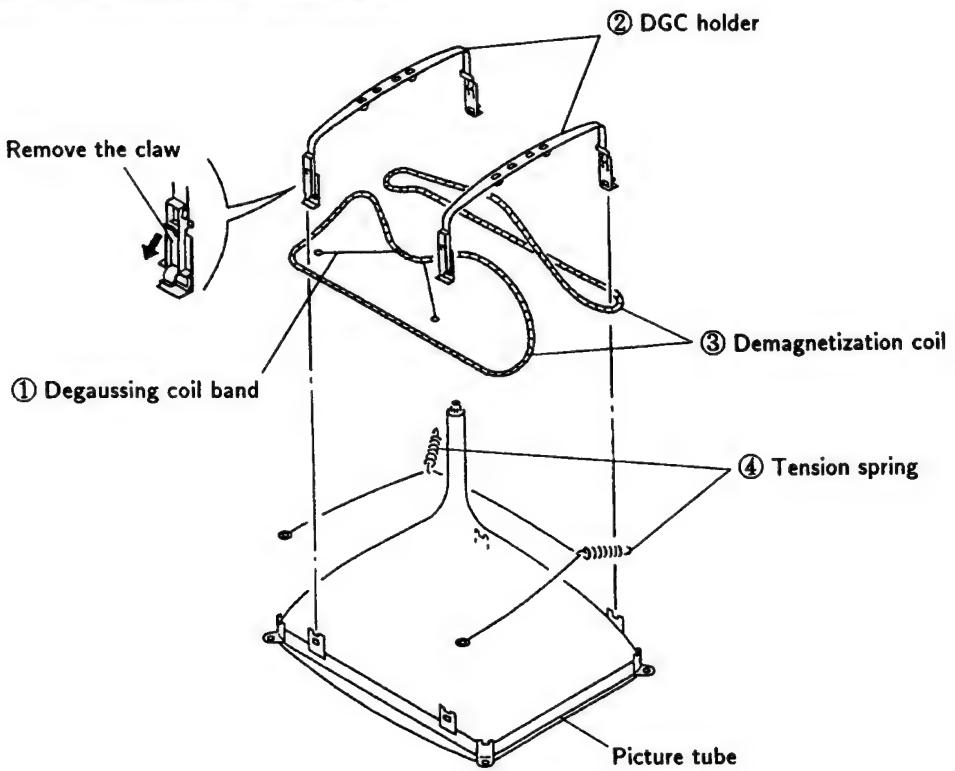
### 2-3. SERVICE POSITION



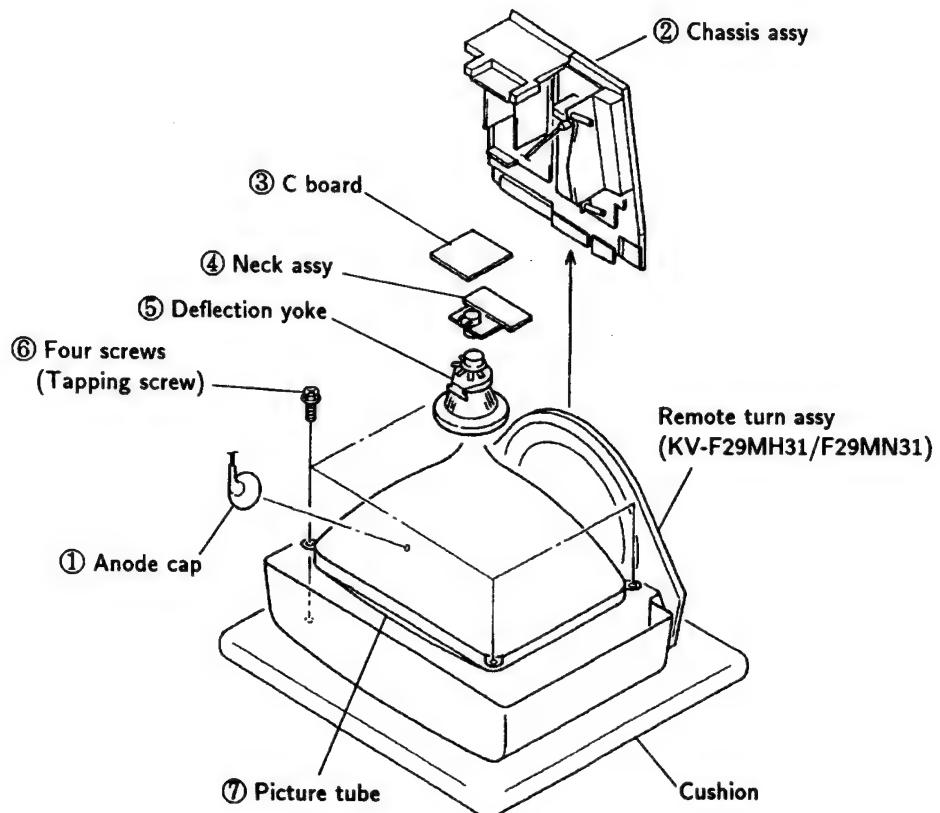
## 2-4. EXTENSION CABLE



## 2-5. DEMAGNETIZATION COIL REMOVAL



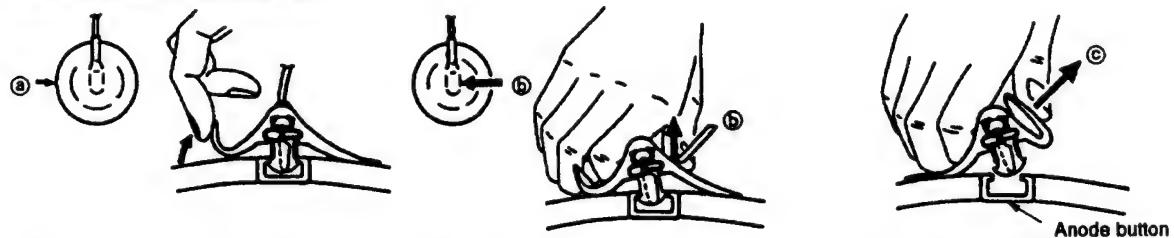
## 2-6. PICTURE TUBE REMOVAL



### • REMOVAL OF ANODE-CAP

NOTE : Short circuit the anode of the picture tube and the anode cap to the metal chassis, CRT shield or carbon painted on the CRT, after removing the anode.

### • REMOVING PROCEDURES



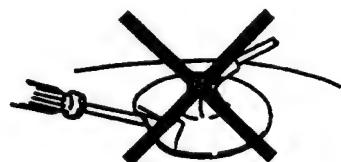
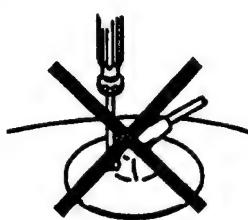
① Turn up one side of the rubber cap in the direction indicated by the arrow ⑧.

② Using a thumb pull up the rubber cap firmly in the direction indicated by the arrow ⑨.

③ When one side of the rubber cap is separated from the anode button, the anode-cap can be removed by turning up the rubber cap and pulling up it in the direction of the arrow ⑩.

### • HOW TO HANDLE AN ANODE-CAP

- ① Don't hurt the surface of anode-caps with sharp shaped material!
- ② Don't press the rubber too hard in order not to hurt inside of anode-caps!  
A material fitting called as shatter-hook terminal is built in the rubber.
- ③ Don't turn the foot of rubber over hard!  
The shatter-hook terminal will stick out or hurt the rubber.



## SECTION 3

## SET-UP ADJUSTMENTS

- The following adjustments should be made when a complete realignment is required or a new picture tube is installed.
- These adjustments should be performed with rated power supply voltage unless otherwise noted.

Perform the adjustments in order as follows :

- Beam Landing
- Convergence
- Focus
- White Balance

**Note :** Test Equipment Required.

- Color-bar/Pattern Generator
- Degausser
- Oscilloscope

Controls and switch should be set as follows unless otherwise noted:

PICTURE control ..... RESET

BRIGHTNESS control ..... CENTER

**Preparations :**

- In order to reduce the influence of geomagnetism on the set's picture tube face it east or west.
- Switch on the set's power and degauss with the degausser.

### 3-1. BEAM LANDING

- Input the white signal with the pattern generator.  
Contrast      |  
    Brightness      | normal
- Position neck ass'y as shown in Fig 3-2.
- Set the pattern generator raster signal to red.
- Move the deflection yoke to the rear and adjust with the purity control so that the red is at the center and the blue and the green take up equally sized areas on each side.  
(See Figures 3-1 through 3-3.)
- Move the deflection yoke forward and adjust so that entire screen is red. (See Figure 3-1.)
- Switch the raster signal to blue, then to green and verify the condition.
- When the position of the deflection yoke has been decided, fasten the deflection yoke with the screws.
- If the beam does not land correctly in all the corners, use a magnet to adjust it.  
(See Figure 3-4.)

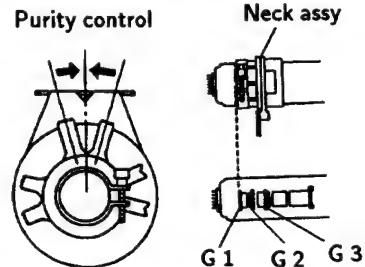
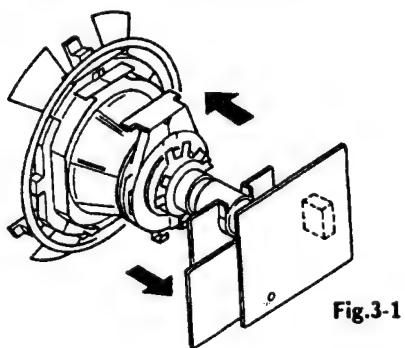


Fig.3-2

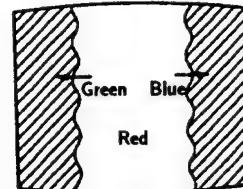
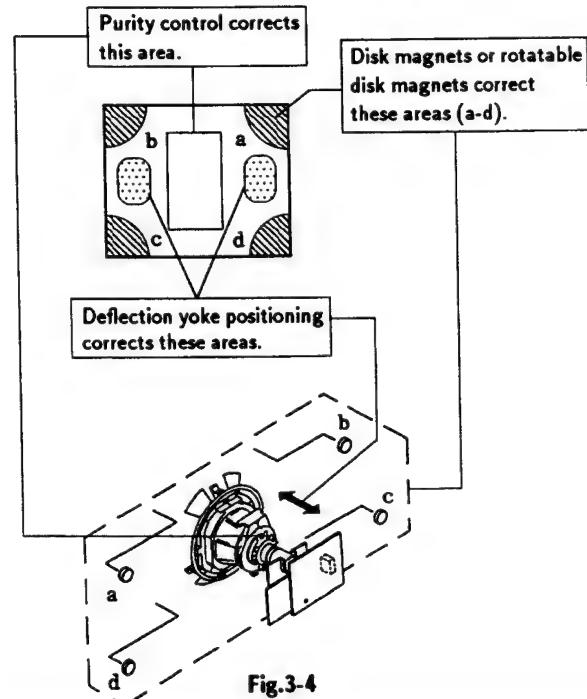


Fig.3-3



**KV-F29MF1/F29MH11/F29MH31**

RM-857

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**KV-F29MN11/F29MN31**

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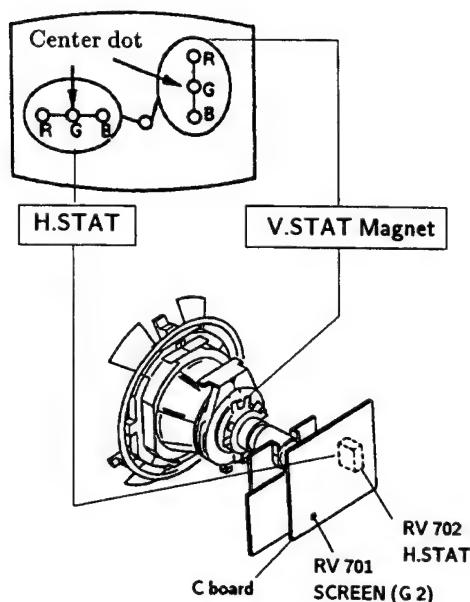
RM-858

### 3-2. CONVERGENCE

#### Preparation :

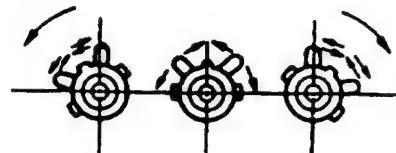
- Before starting this adjustment, adjust the focus, horizontal size, and vertical size.
- Minimize the brightness setting.
- Provide dot pattern.

#### (1) Horizontal and Vertical Static Convergence

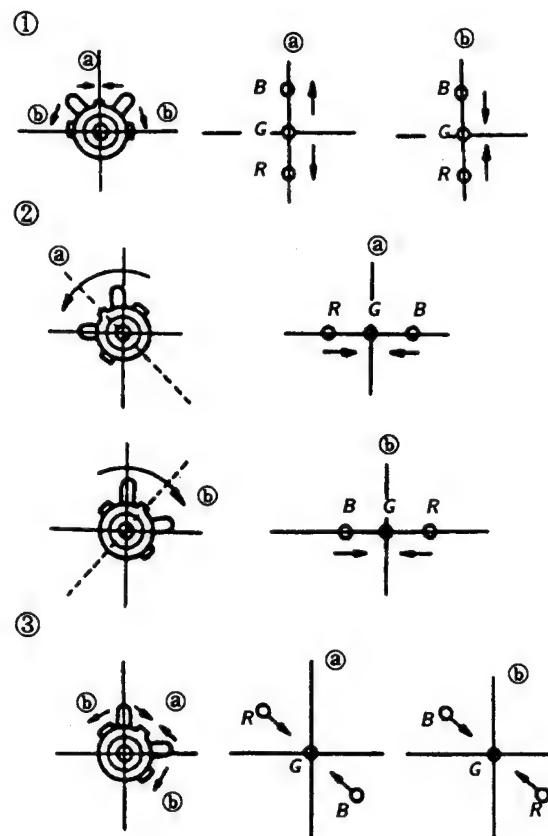


1. (Moving horizontally), adjust the H.STAT control so that the red, green, and blue points are on top of each other at the center of the screen.
2. (Moving vertically), adjust the V.STAT magnet so that the red, green, and blue points are on top of each other at the center of the screen.
3. If the H.STAT variable resistor cannot bring the red, green, and blue points together at the center of the screen, adjust the horizontal convergence with the H.STAT variable resistor and the V.STAT magnet in the manner given below.  
(In this case, the H.STAT variable resistor and the V.STAT magnet influence each other)

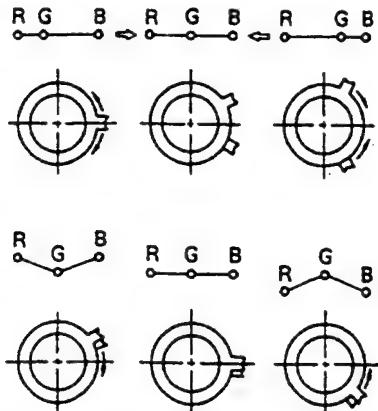
- Tilt the V.STAT magnet and adjust the static convergence by opening or closing the V.STAT magnet.



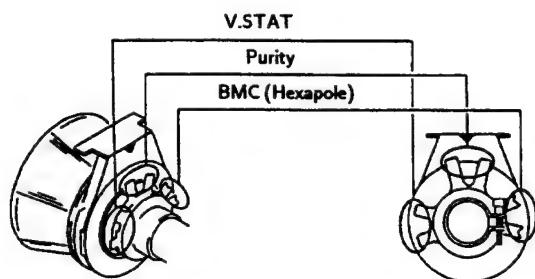
4. If the V.STAT magnet is moved in the direction of the **a** and **b** arrows, the red, green, and blue points move as shown below.



- Operation of BMC (Hexapole) Magnet



- The respective dot positions resulting from moving each magnet interact, so be sure to perform adjustment while tracking. Use the H.STAT VR to adjust the red, green, and blue dots so they coincide at the center of screen (by moving the dots in the horizontal direction).



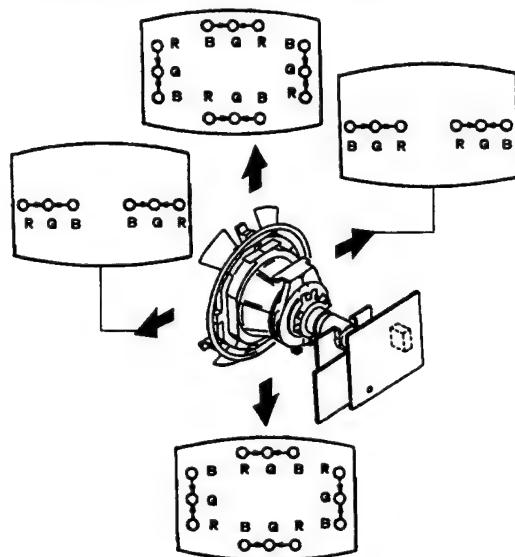
- Y separation axis correction magnet adjustment

- Receive the cross-hatch signal, and adjust [PIC] to "MIN" and [BRT] to "standard".
- Adjust the deflection yoke to the upright condition when it hits the CRT.
- Adjust so that the Y separation axis correction magnet on the neck assembly is symmetrical at the top and bottom (open state).
- Return the deflection yoke to its original position.

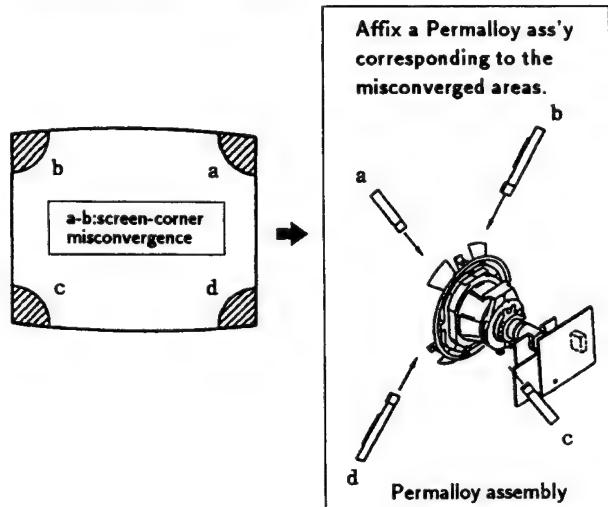
## (2) Dynamic Convergence Adjustment

### Preparations :

- Before starting this adjustment, adjust the horizontal static convergence and the vertical static convergence.
- Slightly loosen the deflection yoke screws.
- Remove the deflection yoke spacer.
- Move the deflection yoke as shown in the figure below and optimize the convergence.
- Tighten the deflection yoke screws.
- Install the deflection yoke spacer.

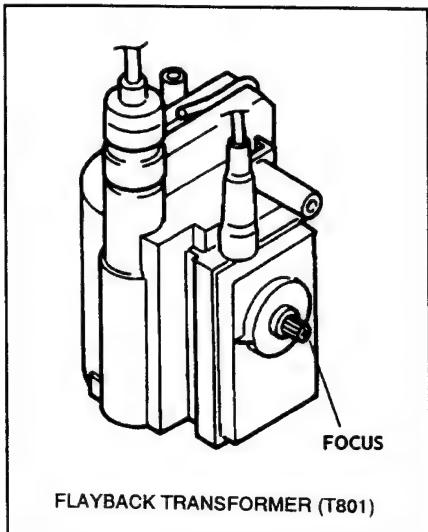


## (3) Screen-corner Convergence



**3-3. FOCUS ADJUSTMENT**

Adjust FOCUS control on the flyback transformer for a best focus.

**a. AN ITEM OF ADJUSTMENT**

Item number	Adjustment item	Standard DATA				Note	
		50 Hz		60 Hz			
		Normal	Wide	Normal	Wide		
05	SBR	1F	1F	1F	1F	SUB-BRIGHTNESS	
07	GDR	1F				G Drive	
08	BDR	1F				B Drive	
09	GCT	07				G CUT-OFF	
0A	BCT	07				B CUT-OFF	

**b. METHOD OF CANCELLATION FROM SERVICE MODE**

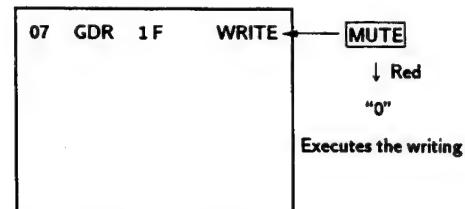
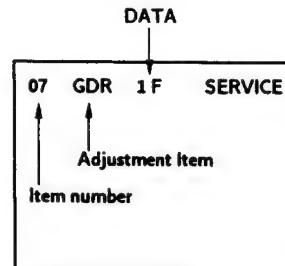
Set the standby condition (Press **POWER** button on the commander) in the next place, press **POWER** button again, hereupon it becomes TV mode.

**c. METHOD OF WRITE FOR MEMORY**

- 1) Set to Service Mode.
- 2) Press **1** (UP) and **4** (DOWN), select an item of adjustments.
- 3) Press **MUTE** button indicate WRITE (RED) on screen.
- 4) Press **0** button to write into memory.

**d. MEMORY WRITE CONFIRMATION METHOD**

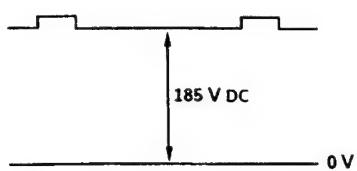
- 1) After adjustment, pull out the plug from AC outlet, and next place, plug in AC outlet again.
- 2) Turn the power switch ON and set to Service Mode.
- 3) Call the adjusted items again, confirm they were adjusted.



### **3-4. G2 (SCREEN) AND WHITE BALANCE ADJUSTMENTS**

## 1. G2 (SCREEN) ADJUSTMENT (RV701)

- 1) Set the PICTURE and BRIGHTNESS to normal.
- 2) Put to VIDEO input mode without signals.
- 3) Set to Service Mode.
- 4) Change BLU data of the item number "4F" from "01" to "00". (To turn off Blue Black.)
- 5) Press **MUTE**, and **0** to write the data in the memory.
- 6) Connect R, G, and B of the C board cathode to the oscilloscope.
- 7) Adjust G2 (RV701) volume to the value below.

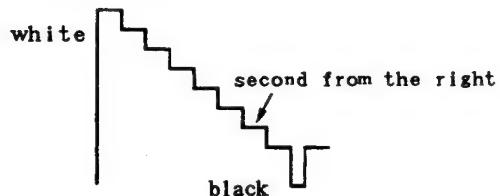


- 8) Re-set BLU data of the item number "4F" from "00" back to "01".
- 9) Press **MUTE**, and **0** to write the data in the memory.

## 2. WHITE BALANCE ADJUSTMENTS

- 1) Set to service mode.
- 2) Input an entire white signal.
- 3) Set the PICTURE to minimum.
- 4) Select SBR(05) with **[1]** and **[4]**, and then set the level to minimum with **[3]** and **[6]**.
- 5) Select GCT(09) and BCT(0A) with **[1]** and **[4]**.  
And adjust the level with **[3]** and **[6]** for the best white balance.
- 6) Set the PICTURE to maximum.
- 7) Select GDR(07) and BDR(08) with **[1]** and **[4]** and  
adjust the level with **[3]** and **[6]** for the best white balance.
- 8) Write into the memory by pressing **MUTE** →  
then **[0]**.

### **3. SUB BRIGHT ADJUSTMENT**



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**KV-F29MN11/F29MN31**

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## SECTION 4

### SELF DIAGNOSIS FUNCTION

If no acknowledgement is returned from a device which is turned "ON", the device has a problem. In this case, one of the LED's responding to the problem device will flicker defined number of times.

Flickering is operated by lighting the LED's for 60ms and turning them off for 600ms.

The flickering frequency responding to each failed device is shown below.

Device	NONVOLATILE MEMORY	AV SWITCH (CXA1545S)	MAIN Y/C (TDA9145)	RGB JUNGLE (CXA1587)	DY DSP (CXD2018)	SURROUND PROCESSOR (TA8776N)
<b>Flickering Frequency</b>	1	2	3	4	5	6

All the devices are checked one after another from the left on the table.

If an error is found, the responding LED will start flickering.

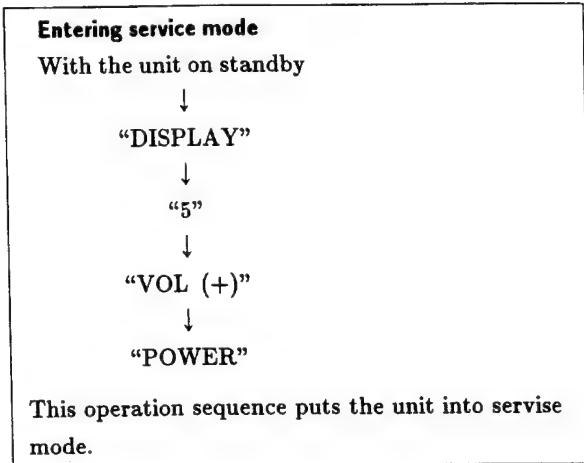
So, if more than 2 devices are failed, the one on the left side will start flickering first.

## SECTION 5

### CIRCUIT ADJUSTMENTS

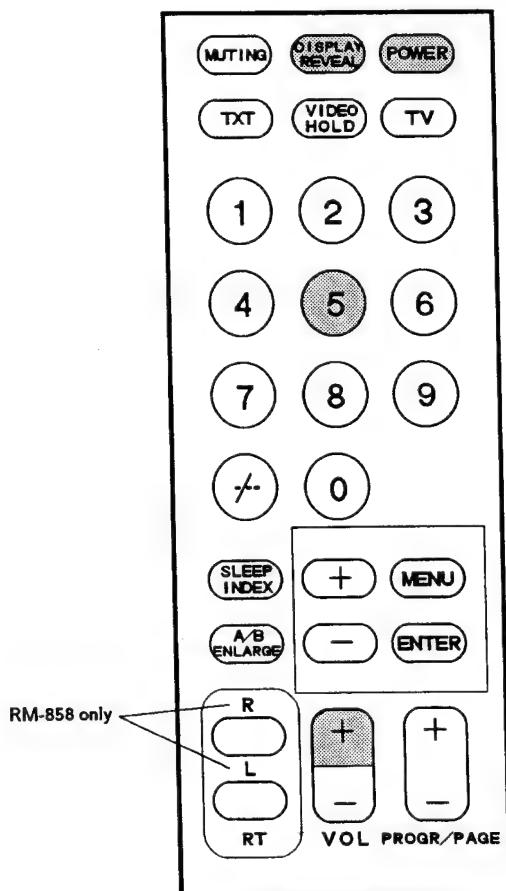
#### 5-1. ADJUSTMENTS WITH COMMANDER

Service adjustments are made with the RM-857 and RM-858 that comes with this unit.



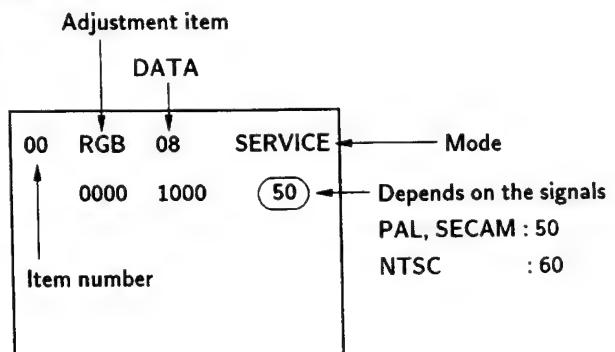
“1”, “4”	Raise/lower the service item number
“3”, “6”	Raise/lower the data
“MUTE”	Writes
“0”	Executes the writing

“7”, “0”	The data all becomes the values in memory
“8”, “0”	User control all goes to the standard state
“5”, “0”	Service data initialization (Be sure not to use usually.)
“2”, “0”	Write 50Hz adjustment data to 60Hz, or vice versa.



RM-857/RM-858

The screen display is :



“1”, “4”	Select the adjustment item.
“3”, “6”	Raise/lower the data.
“MUTE”	Writes
“0”	Executes the writing.

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**KV-F29MN11/F29MN31**

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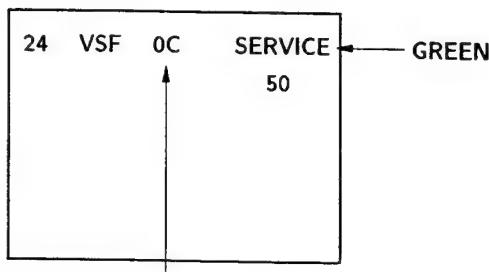
RM-858

## 5-2. ADJUSTMENT METHOD

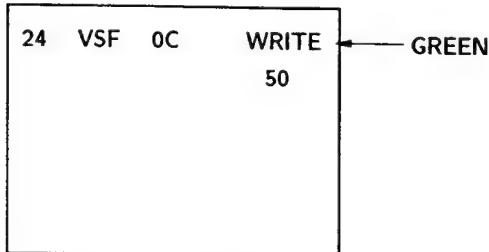
Item Number 24

This explanation uses V-SHFT as an example.

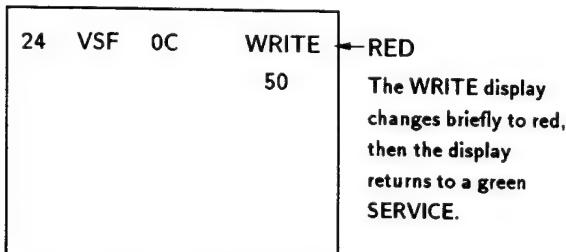
1. Select 24 V-SHFT with the "1" and "4" buttons.
2. Raise/lower the data with the "3" and "6" buttons.
3. Select the optimum state. (The standard is 0F for PAL reception.)
4. Write with the MUTE button. (The display changes to green WRITE.)
5. Execute the writing with the "0" button. (The WRITE display changes briefly to red.)



Adjusted with "3" and "6" buttons



Written with "MUTE"



Write excuted with "0"

Use the same method for Items Number 00-5E. Use "1" and "4" to select the adjustment item, use "3" and "6" to adjust, write with "MUTE", then execute the write with "0".

**Note :** In "WRITE", the data of all items are written together to memory.

**Note :** In item 02 50Hz, or item 03 60Hz, it operates normally in spite of the 50Hz or the 60Hz of the input signal. Therefore be sure to adjust data according to the input signal.

Item number	Adjustment Item	Data range	Standard DATA				Note	Device		
			50 Hz		60 Hz					
			Normal	Wide	Normal	Wide				
00	RGB	00~0F	07	07	07	07	RGB PICTURE	(CXA1587S)		
01	SCN	00~0F	08	06	08	06	SUB-Contrast	(CXA1587S)		
02	VM	00~03	02	02	02	02	VM Level	(CXA1587S)		
03	SCL	00~0F	08	07	08	07	SUB-COLOR	(CXA1587S)		
04	SHU	00~0F	08	08	08	08	SUB-HUE	(CXA1587S)		
05	SBR	00~3F	1F	1F	1F	1F	SUB-BRIGHTNESS	(CXA1587S)		
06	ABL	00~03	03	03	03	03	ABL Mode	(CXA1587S)		
07	GDR	00~3F			1F		G Drive	(CXA1587S)		
08	BDR	00~3F			1F		B Drive	(CXA1587S)		
09	GCT	00~0F			07		G CUT-OFF	(CXA1587S)		
0A	BCT	00~0F			07		B CUT-OFF	(CXA1587S)		
0B	AKR	00~FF			7F		AKB OFF R CUT-OFF	(CXA1587S)		
0C	AKG	00~FF			7F		AKB OFF G CUT-OFF	(CXA1587S)		
0D	AKB	00~FF			7F		AKB OFF B CUT-OFF	(CXA1587S)		
0E	GMA	00~0F		0C		0C	$\gamma$ control	(CXA1587S)		
0F	DCT	00~03		00		00	DC TRAN	(CXA1587S)		
10	DPI	00~03		03		03	D-PIC	(CXA1587S)		
11	YFI	00~3F		22		22	Y Filter Adjust	(CXA1587S)		
12	SHL	00~01		01		01	SHP-LIM	(CXA1587S)		
13	YDL	00~0F		0F		07	Y Delay Time	(CXA1587S)		
14	YSW	00~03		01		01	Y-SW OUT	(CXA1587S)		
15	HSH	00~3F		23		2A	H Shift	(CXA1587S)		
16	POV	00~0F	08	08	08	08	Pre-Over	(CXA1587S)		
17	SHF	00~03	02	02	02	02	SHP-F0	(CXA1587S)		
18	SSH	00~03	01	02	02	03	SUB-Sharpness	(CXA1587S)		
19	RMT	00~01			00		R-Mute	(CXA1587S)		
1A	GMT	00~01			00		G-Mute	(CXA1587S)		
1B	BMT	00~01			00		B-Mute	(CXA1587S)		
1C	AG 1	00~01			00		Aging 1 (White)	(CXA1587S)		
1D	AKF	00~01			00		AKB-OFF	(CXA1587S)		
1E	SMD	00~01		00		00	Scan Mode	(CXA1587S)		
1F	VEX	00~01		00		00	V-Extension	(CXA1587S)		
20	AFC	00~03		03		02	AFC Loop Gain	(CXA1587S)		
21	AFF	00~01		00		00	AFC-OFF	(CXA1587S)		
22	RFP	00~01		00		00	Reference Position	(CXA1587S)		
23	VSZ	00~3F	1E	1E	1A	1A	V-Size	(CXD2018Q)		
24	VSF	00~3F	2E	2E	32	32	V-Shift	(CXD2018Q)		
25	SCR	00~F	08	08	08	08	S-Correction	(CXD2018Q)		
26	VLN	00~F	08	08	08	08	V-Linearity	(CXD2018Q)		
27	HSZ	00~3F	0C	0C	0E	0E	H-Size	(CXD2018Q)		
28	PAP	00~3F	2E	2E	2E	2E	Pin-Amp	(CXD2018Q)		
29	TLT	00~0F	09	09	09	09	Tilt	(CXD2018Q)		
2A	UCP	00~0F	0A	0A	0A	0A	Upper Corner Pin	(CXD2018Q)		
2B	LCP	00~0F	0C	0C	0C	0C	Lower Corner Pin	(CXD2018Q)		
2C	VBW	00~0F	08	08	08	08	V-Bow	(CXD2018Q)		
2D	VAG	00~0F	08	08	08	08	V-Angle	(CXD2018Q)		
2E	HVV	00~07	04	04	07	07	HV-Comp-V	(CXD2018Q)		
2F	HVH	00~07	00	00	00	00	HV-Comp-H	(CXD2018Q)		
30	FCL	00~07			03		Frame Color	(SDA 9188)		
31	FON	00~01			01		Frame ON	(SDA 9188)		
32	DLY	00~07		00		00	Select Delay LL 3P	(SDA 9188)		
33	P-V	00~0F		07		07	V read delay	(SDA 9188)		
34	PVS	00~07		04		04	PIP-V offset	(SDA 9188)		
35	P-H	00~3F		0D		0A	H read delay	(SDA 9188)		
36	PHS	00~0F		04		03	PIP-H offset	(SDA 9188)		

**KV-F29MF1/F29MH11/F29MH31**

RM-857

RM-857

RM-858

**KV-F29MN11/F29MN31**

RM-857

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Item number	Adjustment Item	Data range	Standard DATA				Note	Device		
			50 Hz		60 Hz					
			Normal	Wide	Normal	Wide				
37	CTR	00~0F			0A					
38	EPL	00~01			01		Contrast	(SDA 9188)		
39	FWV	00~01			01		External PLL	(SDA 9188)		
3A	FWH	00~01			01		Frame Width V	(SDA 9188)		
3B	DVI	00~0F			07		Frame Width H	(SDA 9188)		
3C	DVP	00~0F			0F		Setting Delay VSI	(SDA 9188)		
3D	BRT	00~0F			0C		Delay VSP Pulse	(SDA 9188)		
							Frame BRIGHT Data	(SDA 9188)		
3E	LEV	00~0F			00					
3F	STR	00~3F			02		Level Adjust	(TDA9840)		
							Stereo Adjust	(TDA9840)		
40	AXG	00~01			00					
41	AXM	00~01			00		AUX Output Gain	(TDA8204)		
42	VCX	00~01			00		AUX Output Mute	(TDA8204)		
43	ERC	00~01			00		VCXO free run	(TDA8204)		
44	MXE	00~01			00		Error count Time	(TDA8204)		
45	SRO	00~01			00		MAX. allowed Error	(TDA8204)		
46	ATO	00~00			01		SRO set Bit	(TDA8204)		
47	SYS	00~01			00		Auto Selection	(TDA8204)		
48	FSW	00~03			00		System select	(TDA8204)		
49	SYN	00~01			01		Force Switch	(TDA8204)		
							Synthesizer	(TDA8204)		
4A	VCR	00~01			00					
4B	SEL	00~FF			5F		VCC Reference Sw	(CXP1315P)		
							Separation Level	(CXP1315P)		
4C	TXP	00~0F			07					
							Teletext Picture	(Teletext $\mu$ -Con)		
4D	ODL	00~FF			10					
4E	OSH	00~3F			0F		Power ON Delay	(CXP80424)		
4F	BLU	00~01			01		OSD Position H	(CXP80424)		
50	ROC	00~0F			04		Blue Back Feature	(CXP80424)		
51	ROS	00~07			07		Center of Rotation	(CXP80424)		
							Step Width	(CXP80424)		
52	HTR	00~3F	1F	1F	1F	1F				
							H Trapezoid	(CXP80424)		
53	MUT	00~01			01					
54	DID	00~01			00		No Sync. Mute	(CXP80424)		
55	OP0	00~FF			*1		Disable Degauss	(CXP80424)		
56	OP1	00~0F			*2		Option 0	(CXP80424)		
							Option 1	(CXP80424)		

\*1 : Input data are different according to models.

Item	CCD	Text	PinP	Jpn	Nicm	W.G	Mts	Comb
KV-F29MF1	0	0	0	0	0	0	0	1
KV-F29MH11	0	1	0	0	1	1	0	1
KV-F29MH31	0	1	0	0	1	1	0	1
KV-F29MN11	0	1	0	0	1	1	0	1
KV-F29MN31	0	1	0	0	1	1	0	1

\*2 : Input data are different according to models.

Item	—	—	—	Turn	Mono	Tilt	—	Cf
KV-F29MF1	0	0	0	0	0	1	0	1
KV-F29MH11	0	0	0	0	0	1	0	1
KV-F29MH31	0	0	0	1	0	1	0	1
KV-F29MN11	0	0	0	0	0	1	0	1
KV-F29MN31	0	0	0	1	0	1	0	1

NOTE : The above data should be included on page (below the table \*1 and \*2) in order to explain how to convert data from table into service mode value.

### 3-3. PICTURE QUALITY ADJUSTMENTS

Item Numbers 03-05, 18

03 SCL  
 04 SHU  
 05 SBR  
 18 SSH

Set to the standard values.

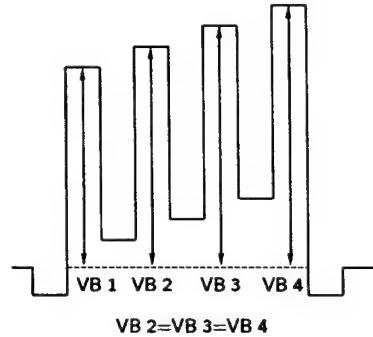
### 5-4. A BOARD ADJUSTMENT

#### SUB CONTRAST ADJUSTMENT (SCN)

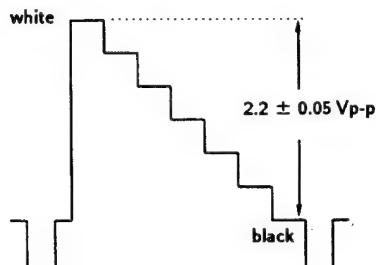
1. Receive a PAL color-bar.
2. Put DC 4.0V to the pin ⑯ (ABL IN) of IC 304, A board. Set the PICTURE 100%, BRIGHT 50% and COLOR MIN.
3. Connect an oscilloscope to the pin ⑥ (R OUT) of CN118, A board.
4. Set to Service Mode and select 01 (SCN) with ① and ④ of the commander to adjust to  $2.2 \pm 0.05$  V.
5. Press **MUTING** → ① of the commander to write the data.
6. Receive a NTSC color-bar and adjust 01 (SCN) same value as PAL.
7. Receive the PAL color-bar to set to WIDE mode by pressing **MENU**. Then set to Service Mode and adjust 01 (SCN) to write the 2 step dropped value of the step 4.
8. Receive the NTSC color-bar and adjust as step 7.

#### SUB COLOR ADJUSTMENT (SCL)

1. Receive a PAL color-bar.  
Set to the following condition :  
PIC 100%, BRT 50%, COL 38%
2. Connect an oscilloscope to the pin ⑦ (B OUT) of CN118, A board.
3. Set to Service Mode and select 03 (SCL) with ① and ④ of the commander to adjust to  $VB2=VB3=VB4$  with ③ and ⑥.
4. Press **MUTING** → ① of the commander to write the data.
5. Adjust as step 4 and 5 by receiving NTSC color-bar.



6. Receive the PAL color-bar to set to WIDE mode by pressing **MENU**. Then set to Service Mode and adjust 03 (SCL) to write the 1 step dropped value of the step 4.
7. Receive the NTSC color-bar and adjust as step 7.



# KV-F29MF1/F29MH11/F29MH31

RM-857

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RM-858

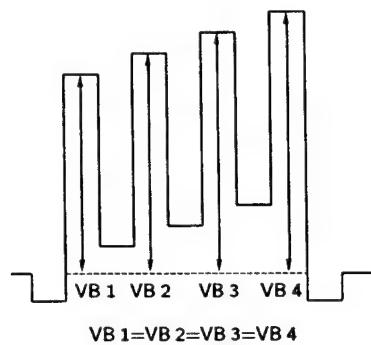
# KV-F29MN11/F29MN31

RM-857

RM-858

## SUB HUE ADJUSTMENT (SHU)

1. Receive a NTSC color-bar.
2. Connect an oscilloscope to the pin ⑦ (B OUT) of CN 118, A board.
3. Select 04 (SHU) with 1 and 4 of the commander by setting to Service Mode and adjust to VB 1=VB 2 =VB 3=VB 4 with 3 and 6.



4. Press MUTING → 0 of the commander to write the data.
5. Set to WIDE Mode by MENU button to write the same value as the step 3.

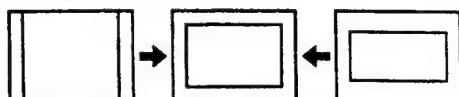
## Y. FILTER ADJUSTMENT (YF1)

1. Set to Service Mode.
2. Select 14 (Y. SW) with the 1 and 4 of the commander to set the data "3" with 3 and 6.
3. Put SINE wave of 4.43 MHz to the pin ② (YIN) of IC304.
4. Connect an oscilloscope to the pin ① of CN105, A board.
5. Adjust so that the waveform is minimum by selecting 11 (YF1) with 3 and 6.  
Change back 14 (Y. SW) to data "1".
6. Press MUTING → 0 of the commander to write the data.

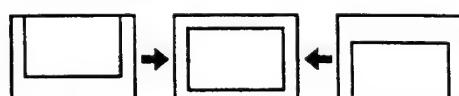
## 5-5. PICTURE DISTORTION ADJUSTMENT

Item Numbers 23-2D

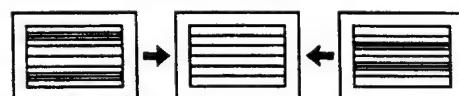
23 VSZ (V SIZE)



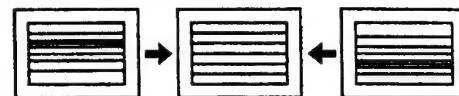
24 VSF (V SHIFT)



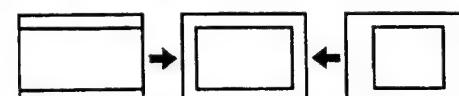
25 SCR (VERTICAL S correction)



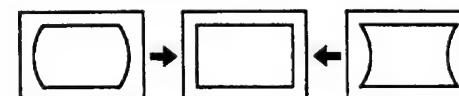
26 VLN (V LINEARITY)



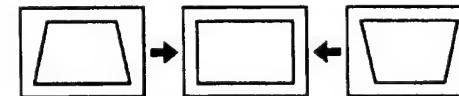
27 HSZ (H SIZE)



28 PAP (PIN AMP)

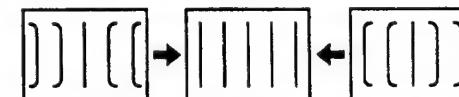


29 TLT (TILT)



2A UCP (Upper Corner Pin)

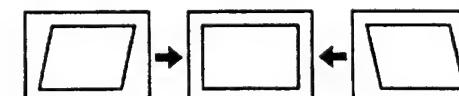
2B LCP (Lower Corner Pin)



2C VBOW (V-BOW)

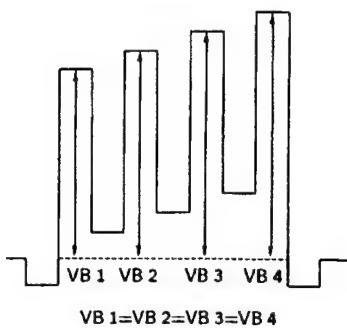


2D VAG (V-ANGLE)



#### **SUB HUE ADJUSTMENT (SHU)**

1. Receive a NTSC color-bar.
2. Connect an oscilloscope to the pin ⑦ (B OUT) of CN 118, A board.
3. Select 04 (SHU) with 1 and 4 of the commander by setting to Service Mode and adjust to VB 1=VB 2 =VB 3=VB 4 with 3 and 6.



4. Press **MUTING** → 0 of the commander to write the data.
5. Set to WIDE Mode by  **MENU** button to write the same value as the step 3.

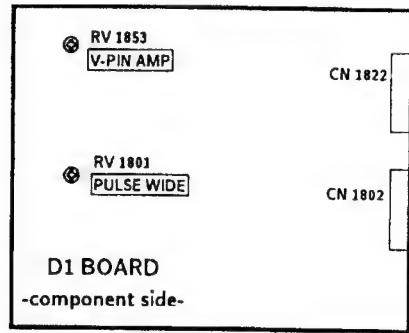
#### **PIP H. V. POSITION (P-H, P-V)**

1. Receive a PAL color-bar.
2. Set the PIP picture by pressing PIP button of the commander.
3. Set to Service Mode.
4. Select 33 (P-V) with the 1 and 4 of the commander to set the data "07" with 3 and 6.
5. Select 35 (P-H) to set the data "0 A".
6. Receive a NTSC color-bar.
7. Select 33 (P-V) to set the data "07" with 3 and 6.  
Select 35 (P-H) to set the data "07" with 3 and 6.
8. Check by pressing **POSITION** of the commander.
9. Press **MUTING** → 0 of the commander to write the data.

#### **Y. FILTER ADJUSTMENT (YF1)**

1. Set to Service Mode.
2. Select 14 (Y. SW) with the 1 and 4 of the commander to set the data "3" with 3 and 6.
3. Put SINE wave of 4.43 MHz to the pin ② (YIN) of IC304.
4. Connect an oscilloscope to the pin ① of CN105, A board.
5. Adjust so that the waveform is minimum by selecting 11 (YF1) with 3 and 6.
6. Press **MUTING** → 0 of the commander to write the data.

### **5-5. D1 BOARD ADJUSTMENT**



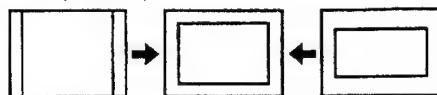
#### **V-PIN AMP, PULSE WIDTH ADJUSTMENT (RV 1853, RV 1801)**

1. Receive a color-bar.
2. Connect AC voltmeter between the pin ① of CN 1802 and GND.
3. Turn RV 1853 clockwise to the end and RV 1801 counterclockwise to the end.
4. Turn RV 1801 clockwise a little to adjust the value on the AC voltmeter to AC  $25 \pm 0.5$  Vp-p.

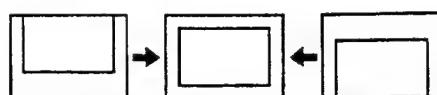
## 5-6. PICTURE DISTORTION ADJUSTMENT

Item Numbers 23-2D

23 VSZ (V SIZE)



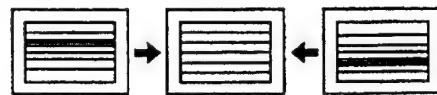
24 VSF (V SHIFT)



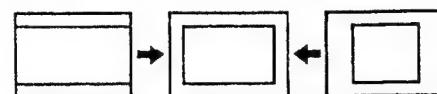
25 SCR (VERTICAL S correction)



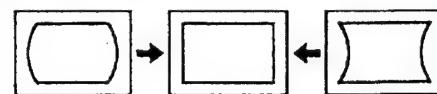
26 VLN (V LINEARITY)



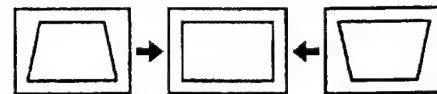
27 HSZ (H SIZE)



28 PAP (PIN AMP)



29 TLT (TILT)

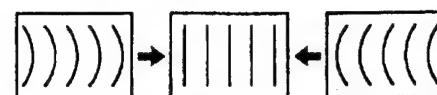


2A UCP (Upper Corner Pin)

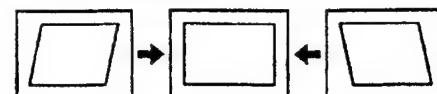
2B LCP (Lower Corner Pin)



2C VBOW (V-BOW)

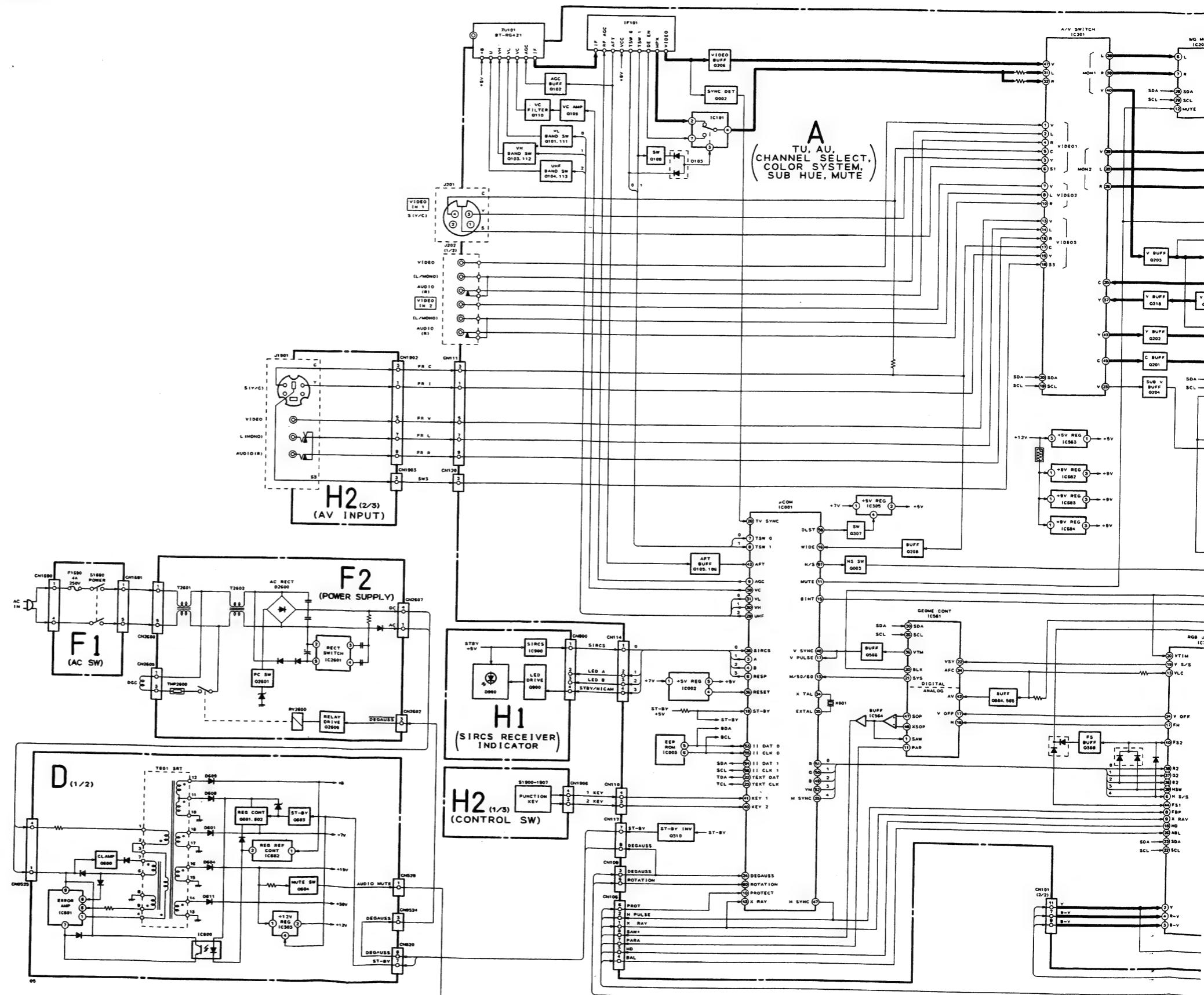


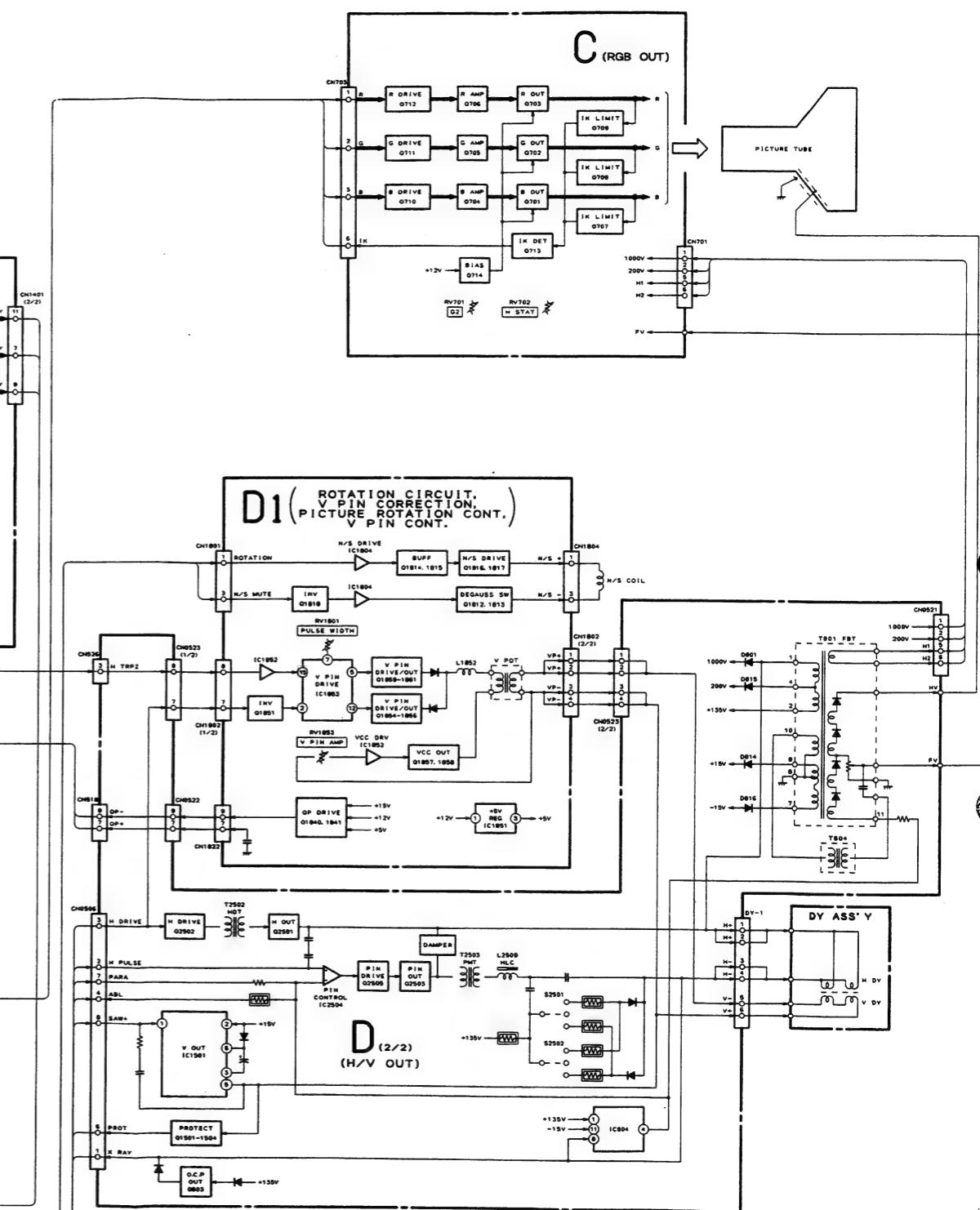
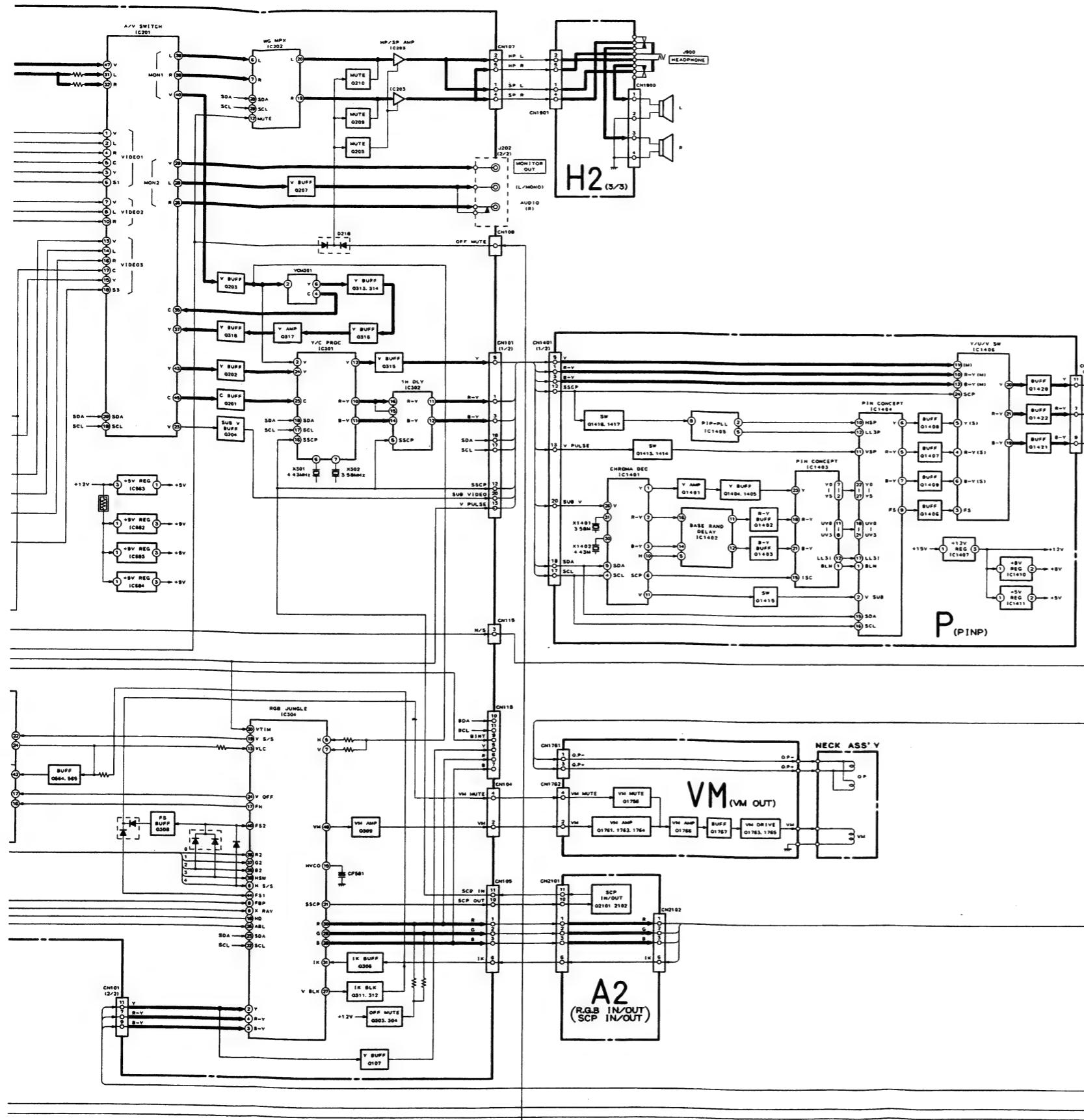
2D VAG (V-ANGLE)



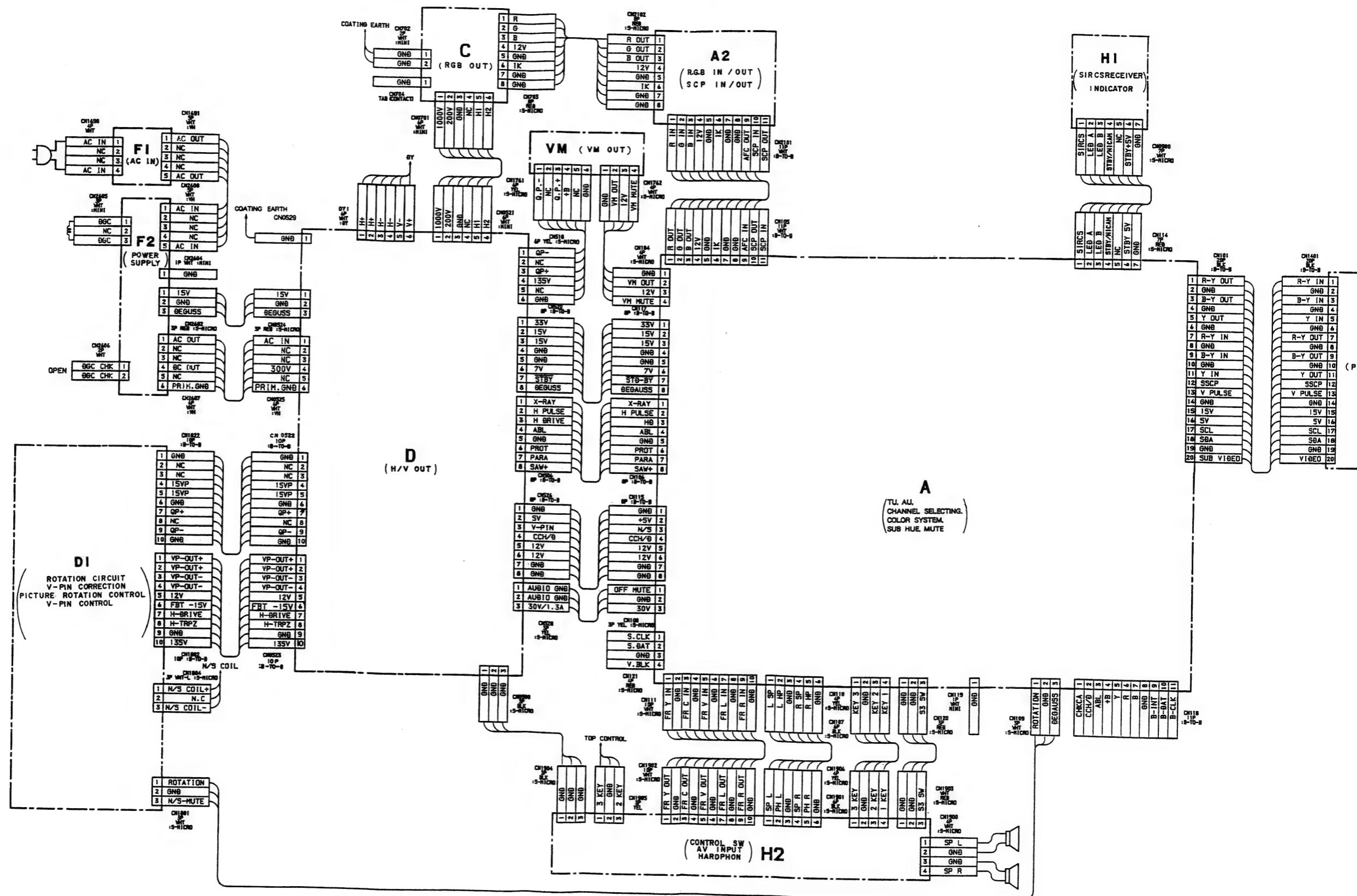
# DIAGRAMS

## 6-1. BLOCK DIAGRAM

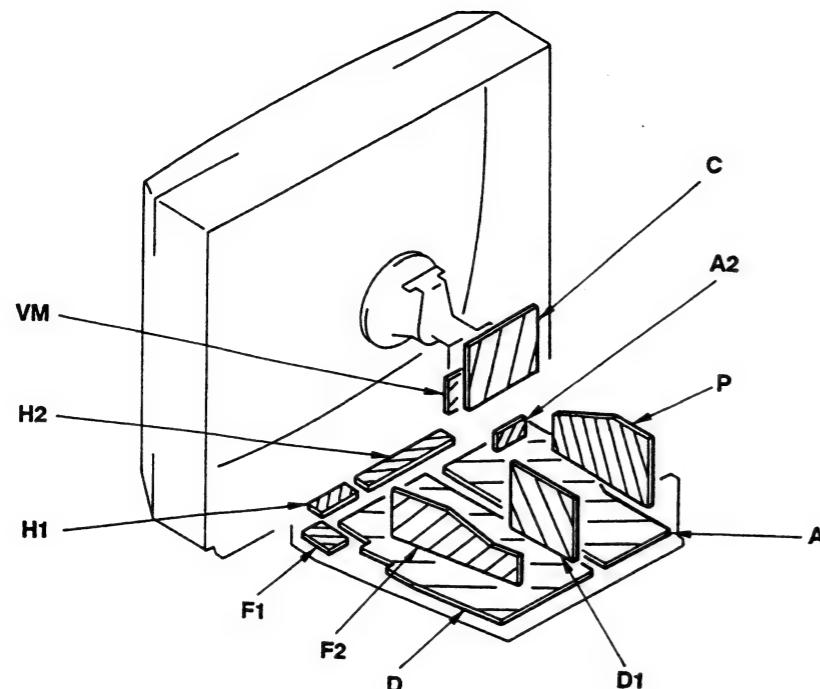




## 6-2. FRAME SCHEMATIC DIAGRAM



## CIRCUIT BOARDS LOCATION



## 6-4. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

### Note:

- All capacitors are in  $\mu\text{F}$  unless otherwise noted.  $\text{pF}$ :  $\mu\mu\text{F}$  50  $\text{mV}$  or less are not indicated except for electrolytic and tantalums.
- All resistors are in ohms.  
 $\text{k}\Omega = 1000\Omega$ ,  $\text{M}\Omega = 1000\text{K}\Omega$
- Indication of resistance, which does not have one for rating electrical power, is as follows.

Pitch: 5 mm  
 Rating electrical power  $\frac{1}{4}$  W (CHIP: 1/10W)

- : nonflammable resistor.
- : internal component.
- : panel designation, or adjustment for repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- Readings are taken with a color-bar signal input.  
 no mark : PAL  
 < > : SECAM  
 ( ) : NTSC 3.58  
 ( ) : NTSC 4.43
- Readings are taken with a 10  $\text{M}\Omega$  digital multimeter.
- Voltage are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal production tolerances.
- All voltages are in V.
- \* : Can not be measured.
- Circled numbers are waveform reference.
- :  $\text{B}+$  bus.
- :  $\text{B}-$  bus.
- : signal path.

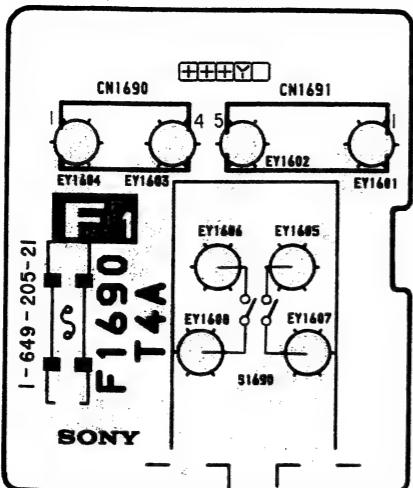
Note: The components identified by shading and mark are critical for safety. Replace only with part number specified.

### Reference information

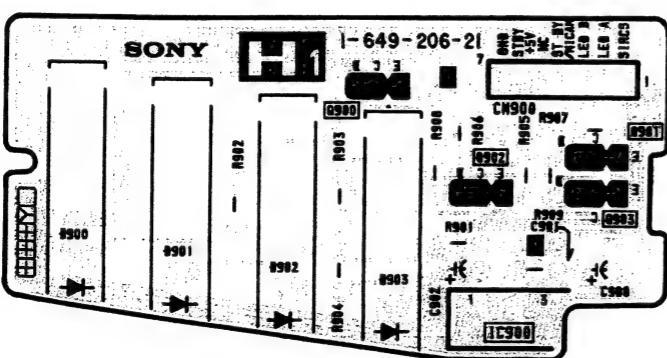
RESISTOR	: RN	METAL FILM
	: RC	SOLID
	: FPRD	NONFLAMMABLE CARBON
	: FUSE	NONFLAMMABLE FUSIBLE
	: RS	NONFLAMMABLE METAL OXIDE
	: RB	NONFLAMMABLE CEMENT
	: RW	NONFLAMMABLE WIREWOUND
	: *	ADJUSTMENT RESISTOR
COIL	: LF-8L	MICRO INDUCTOR
CAPACITOR	: TA	TANTALUM
	: PS	STYROL
	: PP	POLYPROPYLENE
	: PT	MYLAR
	: MPS	METALIZED POLYESTER
	: MPP	METALIZED POLYPROPYLENE
	: ALB	BIPOLAR
	: ALT	HIGH TEMPERATURE
	: ALR	HIGH RIPPLE

## PRINTED WIRING BOARDS

– F1 Board –



– H1 Board –



-39-

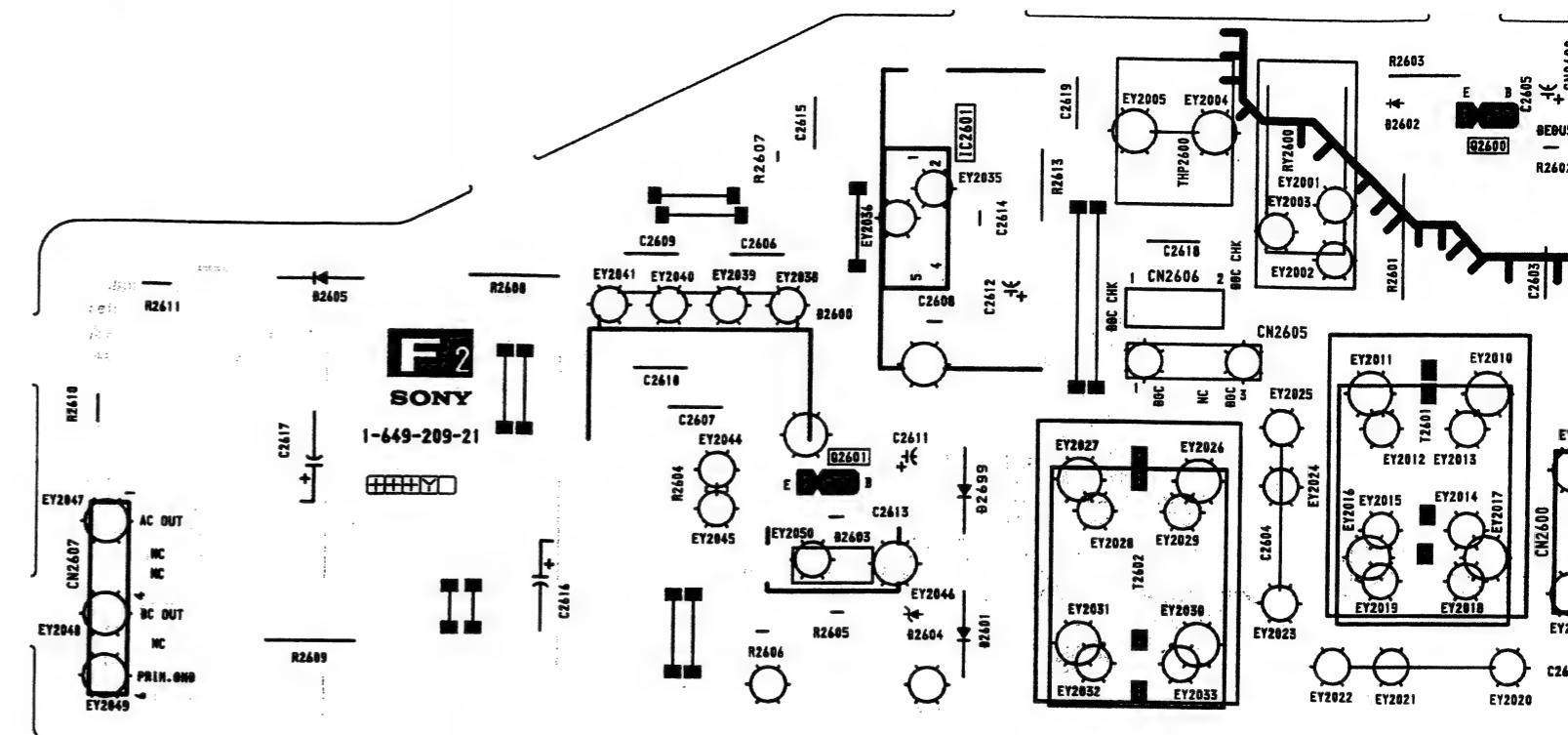
**F<sub>1</sub>** [AC IN]

## H1 SIRCS RECEIVER, INDICATOR

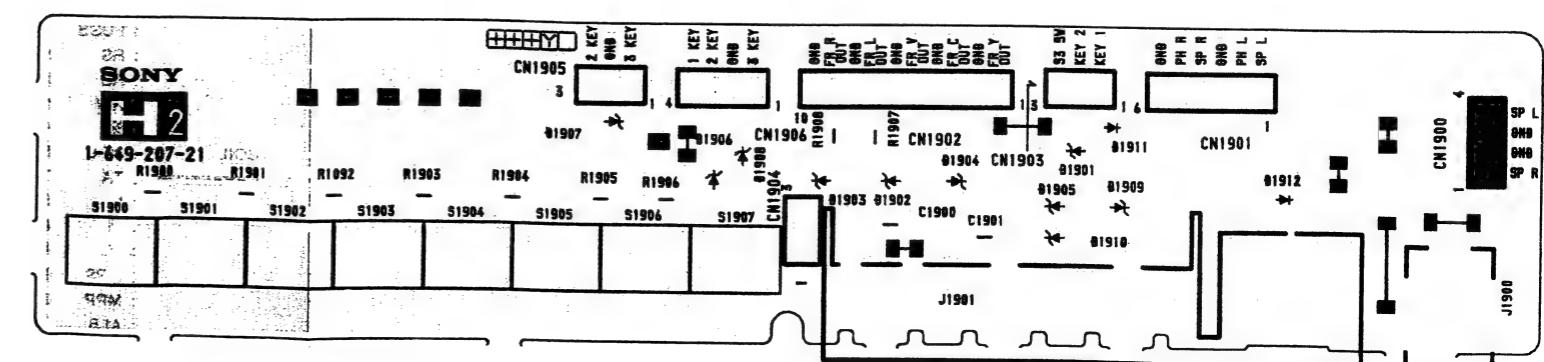
**F2** [POWER SUPPLY]

**H2** CONTROL SW,  
AV INPUT,  
HEADPHONE

– F2 Board –



– H2 Board –



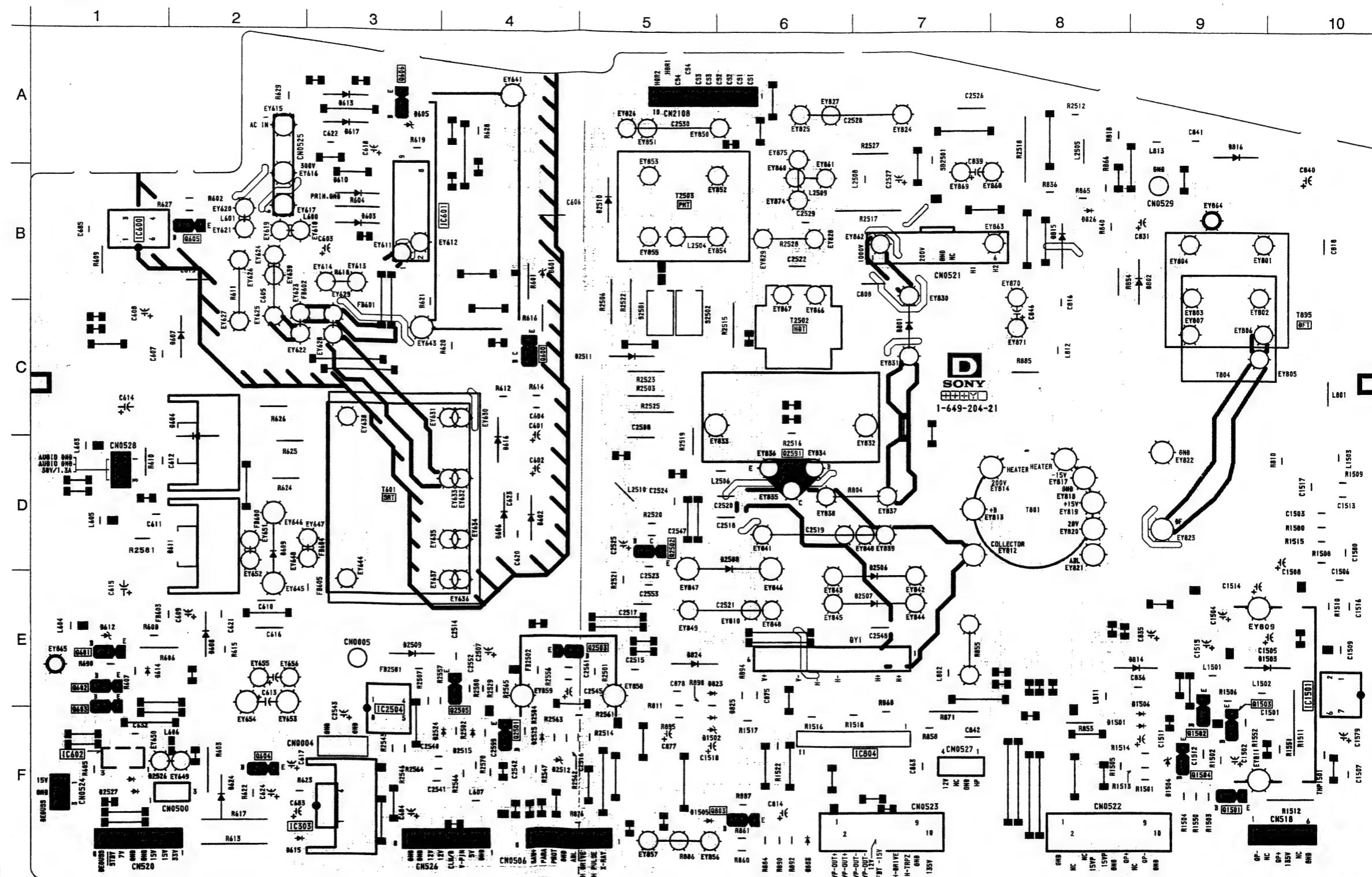
**NOTE:**  
The cir  
600 Vp  
inspecti

– D Board –

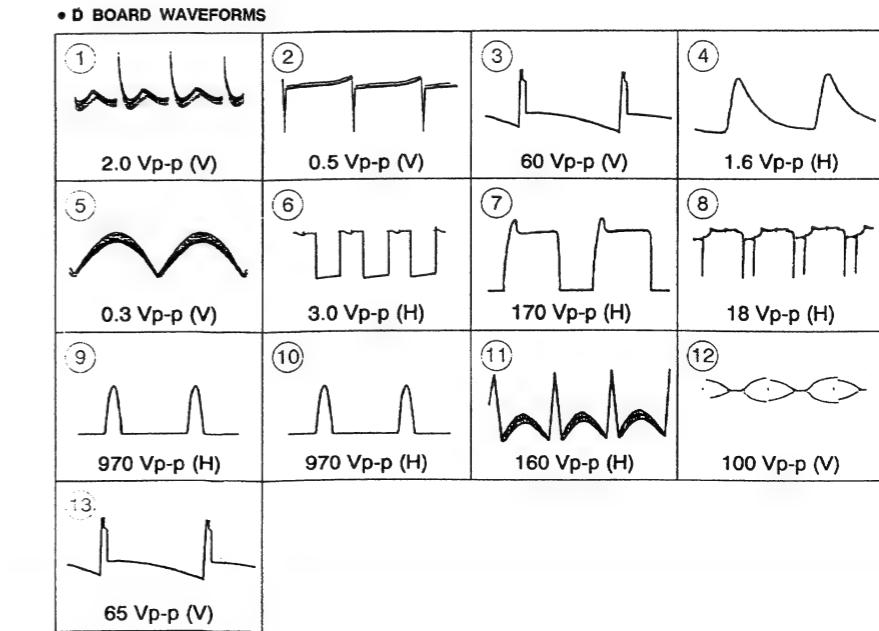
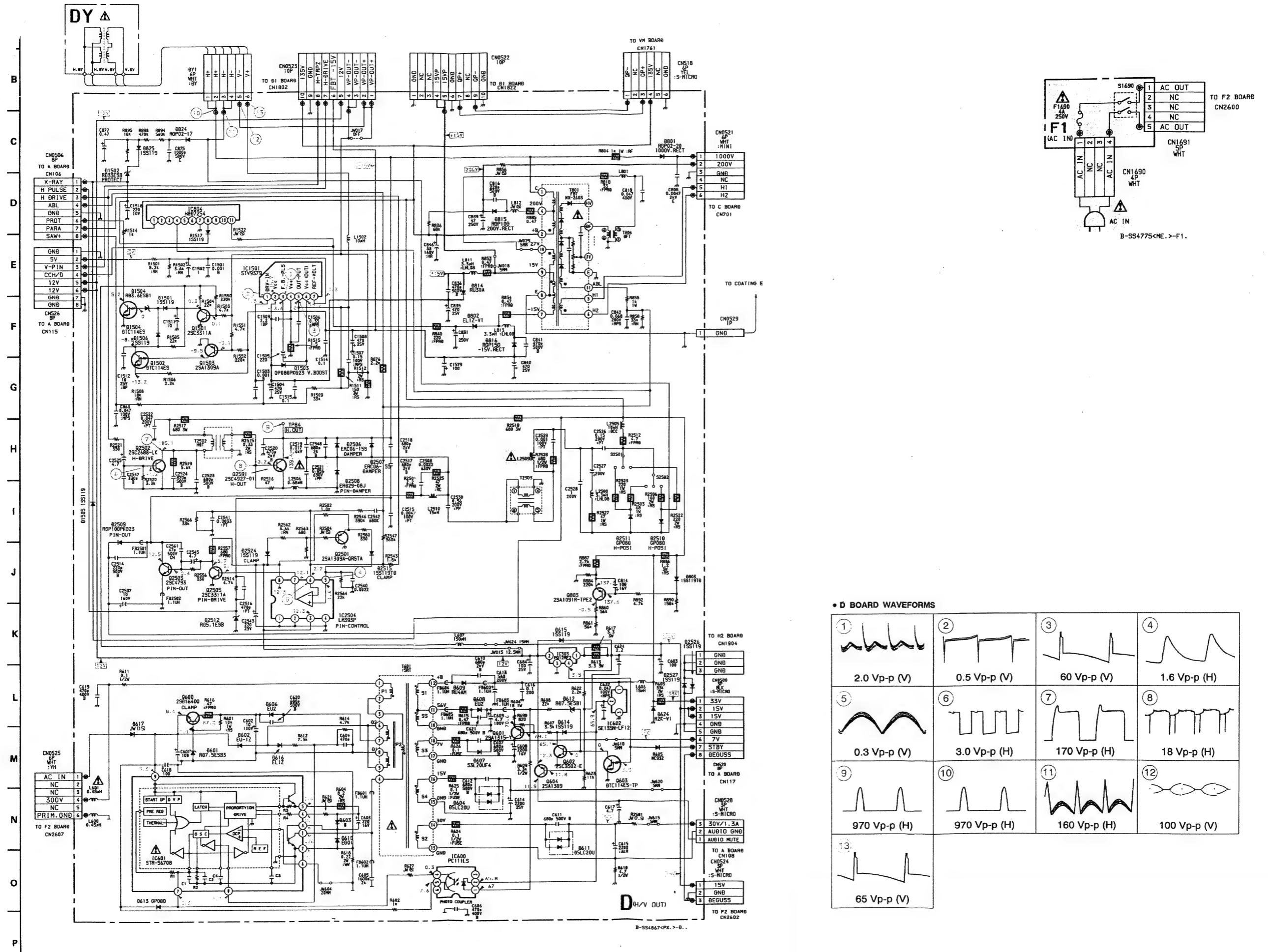
D [H/V OUT]

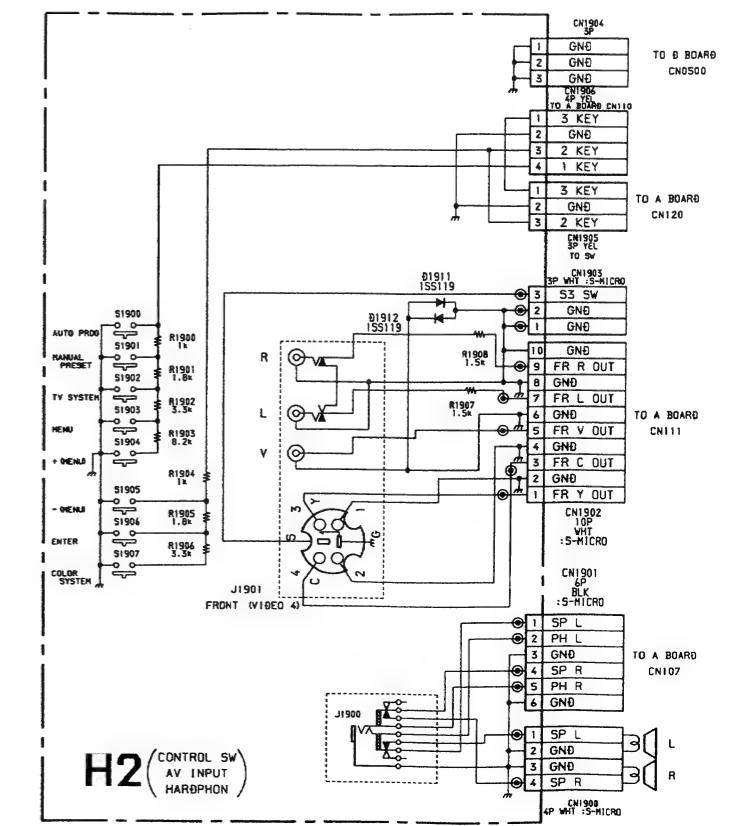
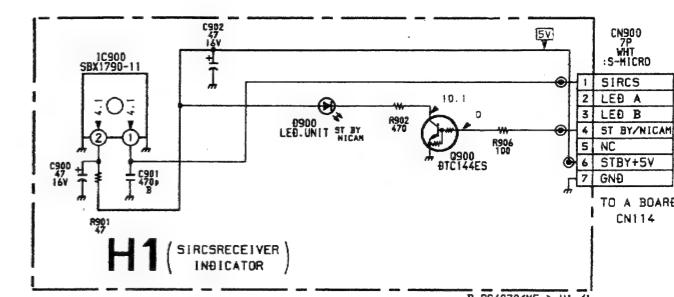
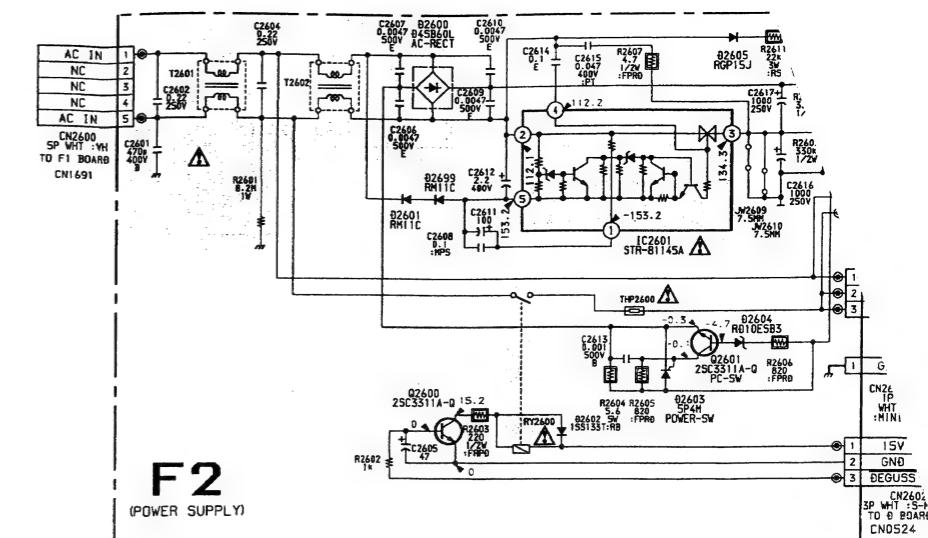
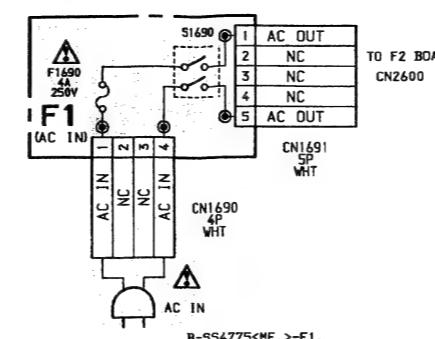
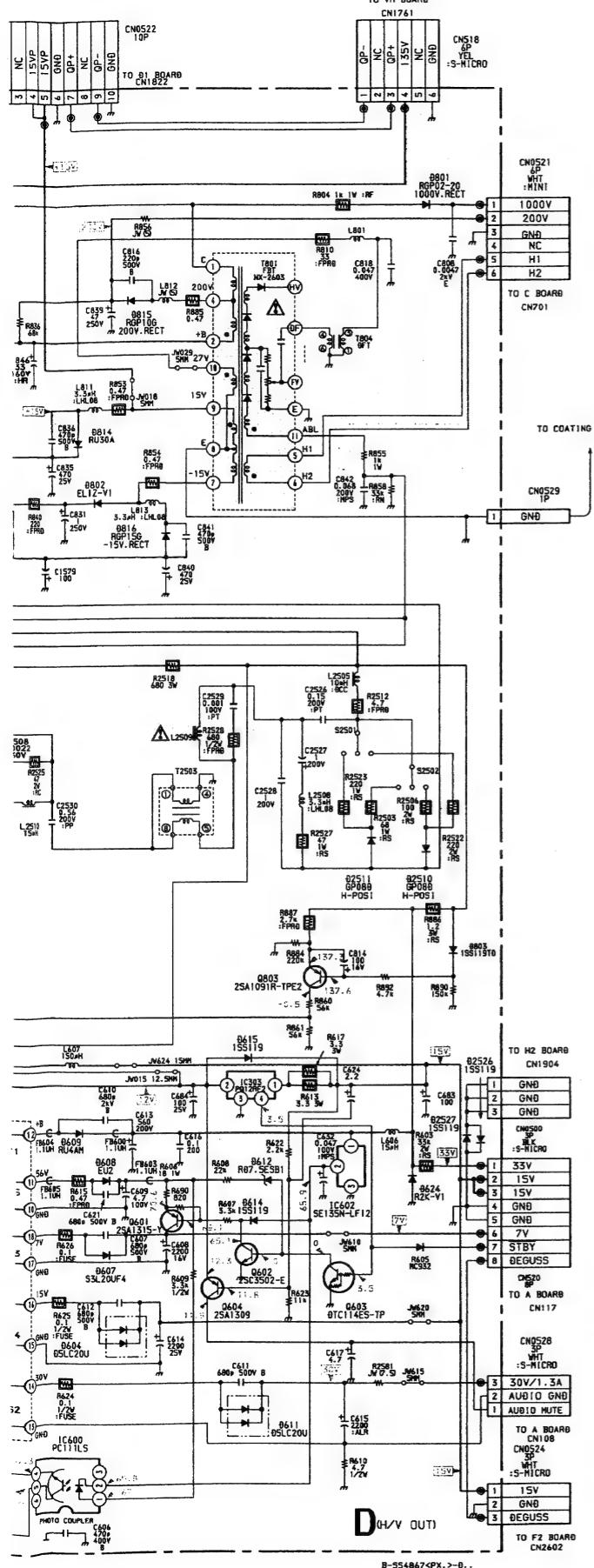
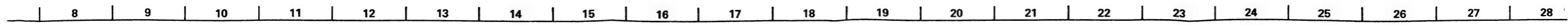
• D BOARD

IC		DIODE	
IC303	F - 3	D601	B - 4
IC600	B - 1	D602	D - 4
IC601	B - 3	D604	C - 2
IC602	F - 1	D606	D - 4
IC804	F - 7	D607	C - 2
IC1501	E - 10	D608	E - 2
IC2504	E - 3	D609	D - 2
		D610	B - 3
		D611	D - 2
		D612	E - 1
		D613	A - 3
		D614	E - 1
		D615	F - 2
		D616	D - 4
		D617	A - 3
		D624	F - 2
		D801	C - 7
TRANSISTOR		D802	B - 9
		D803	F - 6
Q600	C - 4	D814	E - 9
Q601	E - 1	D815	B - 8
Q602	E - 1	D816	A - 9
Q603	E - 1	D824	E - 5
Q604	F - 3	D825	E - 5
Q803	F - 6	D1501	E - 9
Q1501	F - 9	D1502	F - 5
Q1502	E - 9	D1503	E - 10
Q1503	E - 9	D1504	F - 9
Q1504	F - 9	D1505	F - 5
Q2501	F - 4	D1506	E - 9
Q2502	D - 5	D2506	D - 7
Q2503	E - 4	D2507	E - 7
Q2505	E - 4	D2508	D - 6
Q2591	D - 6	D2509	E - 3
		D2510	B - 5
		D2511	C - 5
		D2512	F - 4
		D2515	F - 4
		D2524	F - 3
		D2526	F - 1
		D2527	F - 1



ted as left contains high voltage of over  
ist be paid to prevent an electric shock in  
ring.





• D BOARD WAVEFORM

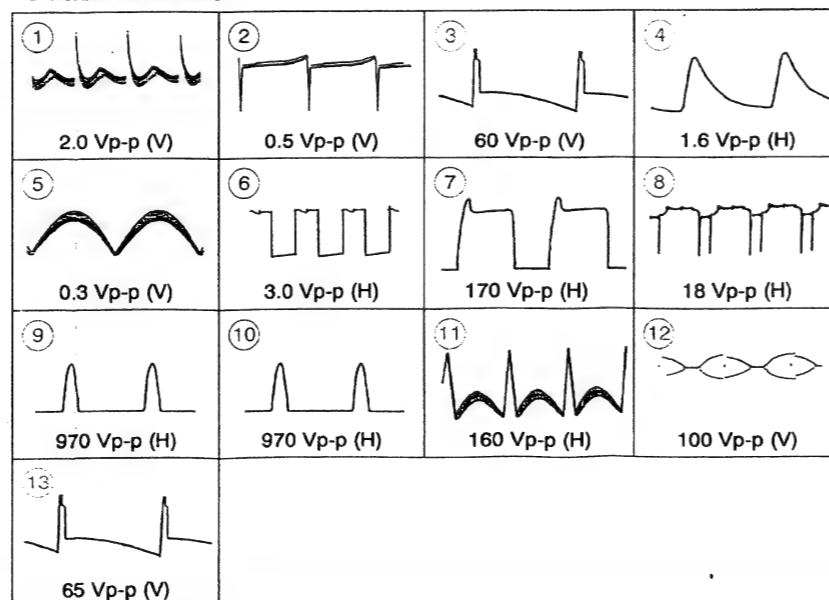
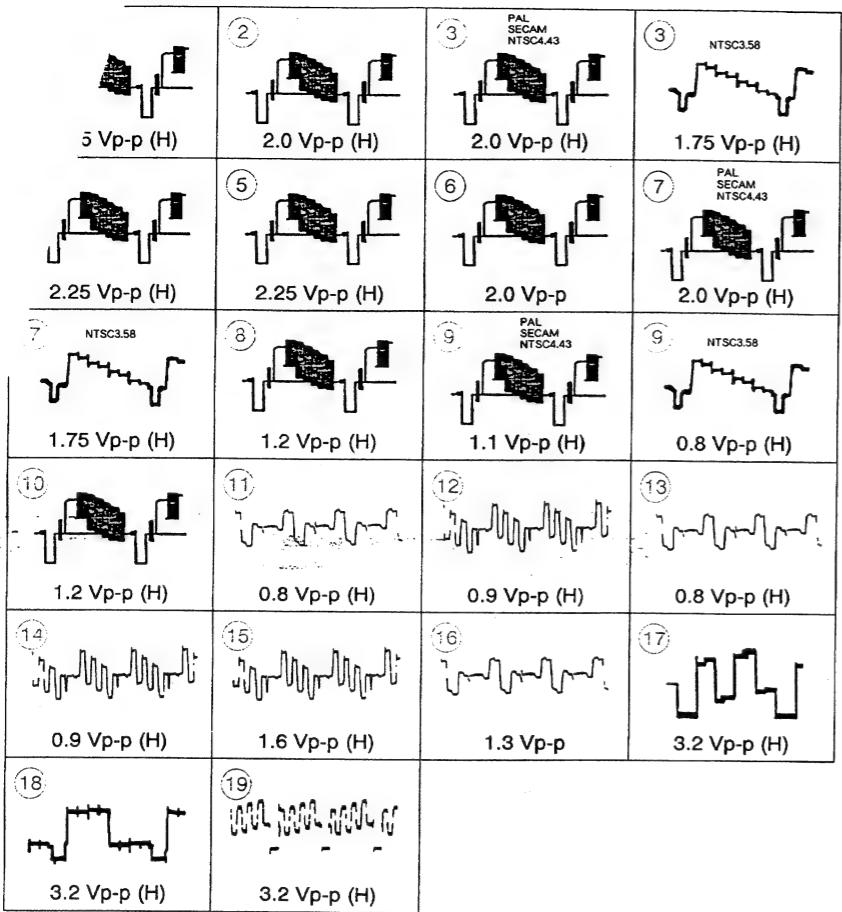
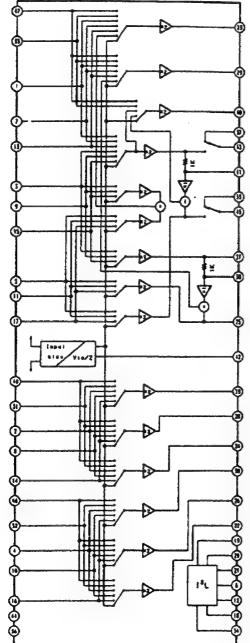


Diagram of A Board

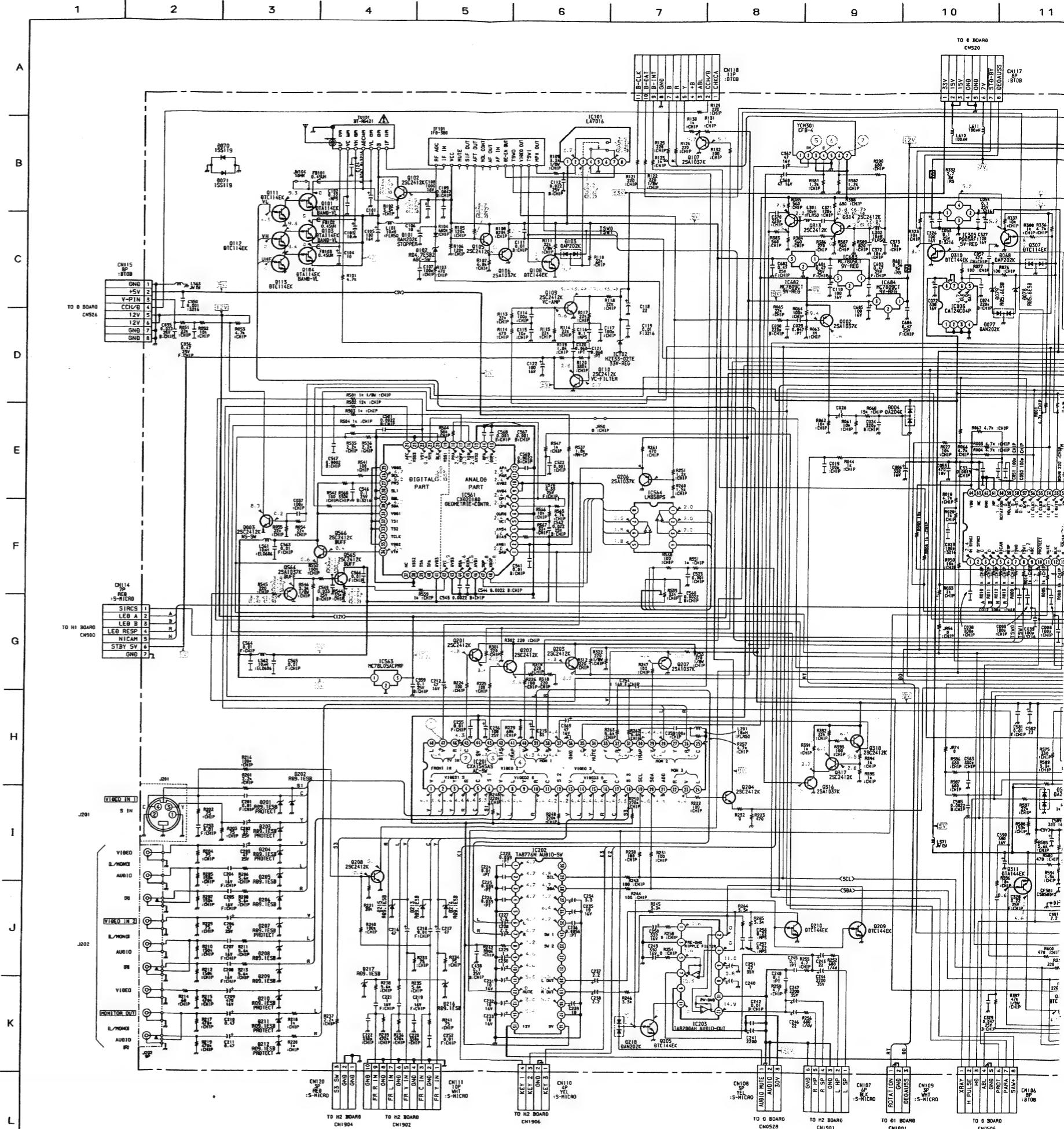
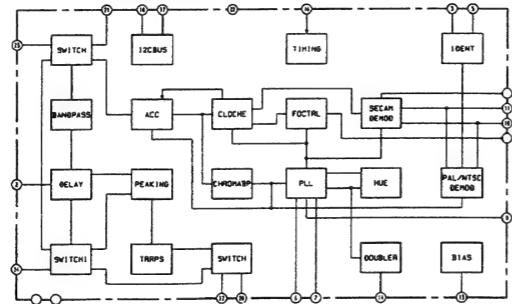
AVEFORMS

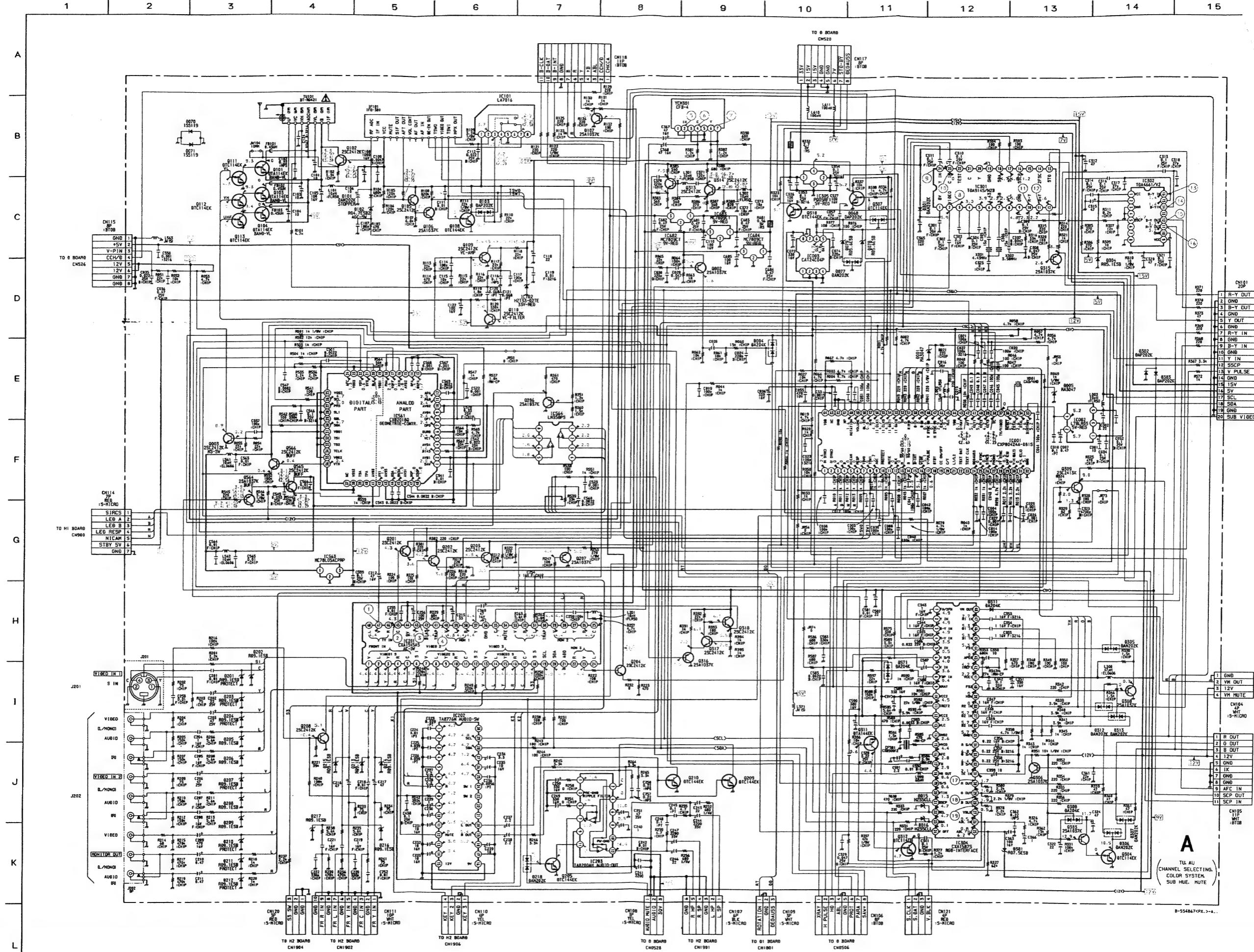


A Board IC201 CXA1545AS

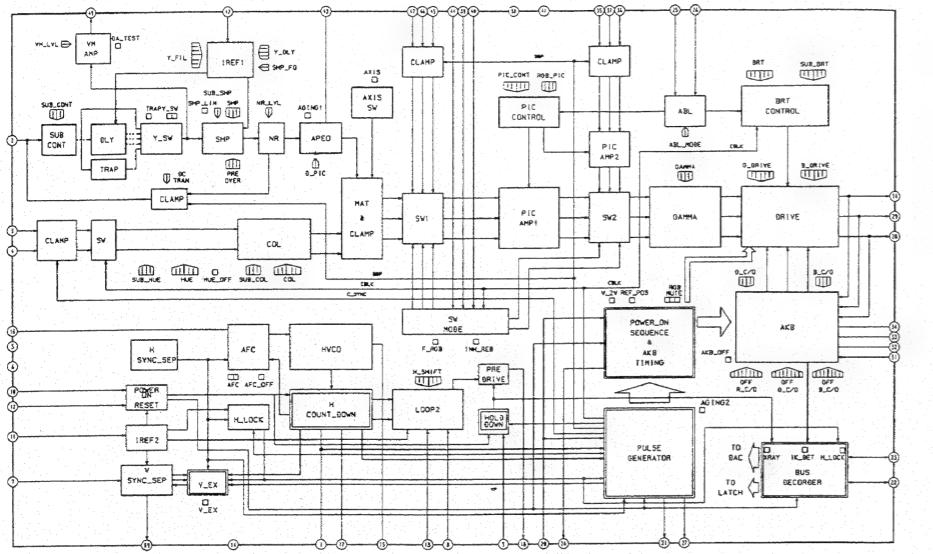


A Board IC301 TDA9145





A Board IC304 CXA1587S



## • A BOARD

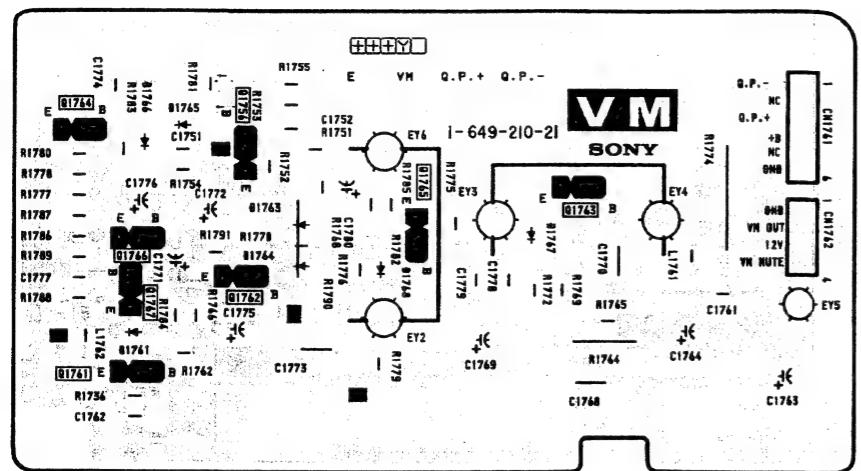
IC	Q104	E - 9	Q312	D - 1	D204	C - 9	IF BLOCK
IC001	B - 2	Q105	E - 6	Q313	B - 9	D205	B - 9
IC002	C - 3	Q106	E - 6	Q314	A - 9	D206	B - 9
IC003	C - 1	Q107	A - 9	Q315	E - 3	D207	C - 9
IC101	D - 6	Q109	D - 9	Q316	A - 9	D208	C - 9
IC102	C - 8	Q110	D - 9	Q317	A - 9	D209	C - 9
IC201	C - 9	Q111	D - 9	Q318	A - 8	D210	D - 9
IC202	B - 6	Q112	E - 9	Q564	B - 5	D211	D - 9
IC203	D - 5	Q113	E - 9	Q565	B - 5	D212	D - 9
IC301	E - 3	Q201	B - 9	Q566	C - 5	D213	C - 8
IC302	E - 4	Q202	B - 8			D214	C - 8
IC304	D - 2	Q203	B - 8			D215	C - 8
IC305	A - 2	Q204	C - 7			X001	C - 3
IC561	C - 5	Q205	D - 5	D001	B - 2	X301	E - 3
IC563	B - 5	Q206	B - 9	D004	C - 1	X302	E - 2
IC564	B - 4	Q207	B - 8	D005	C - 2		
IC682	A - 7	Q208	C - 7	D015	E - 1		
IC683	B - 6	Q209	D - 6	D016	E - 1		
IC684	B - 6	Q210	D - 5	D020	C - 1		
			D077	C - 1	D302	E - 5	
			D078	C - 1	D303	E - 2	
			D079	C - 1	D304	E - 4	
			D080	C - 1	D305	C - 2	
			D081	C - 2	D306	D - 2	
			D082	C - 2	D307	C - 2	
			D083	E - 1	D308	C - 2	
			D084	E - 1	D311	C - 3	
			D085	A - 1	D312	C - 2	
			D086	D - 2	D313	C - 2	
			D087	D - 2	D314	C - 2	
			D088	D - 1	D315	C - 2	
			D089	D - 1	D316	C - 2	
			D090	D - 1	D317	C - 2	
			D091	D - 1	D318	C - 2	
			D092	D - 1	D319	C - 2	
			D093	D - 1	D320	C - 2	
			D094	D - 1	D321	C - 2	
			D095	D - 1	D322	C - 2	
			D096	D - 1	D323	C - 2	
			D097	D - 1	D324	C - 2	
			D098	D - 1	D325	C - 2	
			D099	D - 1	D326	C - 2	
			D100	D - 1	D327	C - 2	
			D101	D - 1	D328	C - 2	
			D102	D - 1	D329	C - 2	
			D103	D - 1	D330	C - 2	
			D104	D - 1	D331	C - 2	
			D105	D - 1	D332	C - 2	
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			D115	D - 1	D342	C - 2	
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			D117	D - 1	D344	C - 2	
			D118	D - 1	D345	C - 2	
			D119	D - 1	D346	C - 2	
			D120	D - 1	D347	C - 2	
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			D122	D - 1	D349	C - 2	
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			D125	D - 1	D352	C - 2	
			D126	D - 1	D353	C - 2	
			D127	D - 1	D354	C - 2	
			D128	D - 1	D355	C - 2	
			D129	D - 1	D356	C - 2	
			D130	D - 1	D357	C - 2	
			D131	D - 1	D358	C - 2	
			D132	D - 1	D359	C - 2	
			D133	D - 1	D360	C - 2	
			D134	D - 1	D361	C - 2	
			D135	D - 1	D362	C - 2	
			D136	D - 1	D363	C - 2	
			D137	D - 1	D364	C - 2	
			D138	D - 1	D365	C - 2	
			D139	D - 1	D366	C - 2	
			D140	D - 1	D367	C - 2	
			D141	D - 1	D368	C - 2	
			D142	D - 1	D369	C - 2	
			D143	D - 1	D370	C - 2	
			D144	D - 1	D371	C - 2	
			D145	D - 1	D372	C - 2	
			D146	D - 1	D373	C - 2	
			D147	D - 1	D374	C - 2	
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			D158	D - 1	D385	C - 2	
			D159	D - 1	D386	C - 2	
			D160	D - 1	D387	C - 2	
			D161	D - 1	D388	C - 2	
			D162	D - 1	D389	C - 2	
			D163	D - 1	D390	C - 2	
			D164	D - 1	D391	C - 2	
			D165	D - 1	D392	C - 2	
			D166	D - 1	D393	C - 2	
			D167	D - 1	D394	C - 2	
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			D174	D - 1	D401	C - 2	
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			D176	D - 1	D403	C - 2	
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			D180	D - 1	D407	C - 2	
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			D183	D - 1	D410	C - 2	
			D184	D - 1	D411	C - 2	
			D185	D - 1	D412	C - 2	
			D186	D - 1	D413	C - 2	
			D187	D - 1	D414	C - 2	
			D188	D - 1	D415	C - 2	
			D189	D - 1	D416	C - 2	
			D190	D - 1	D417	C - 2	
			D191	D - 1	D418	C - 2	
			D192	D - 1	D419	C - 2	
			D193	D - 1	D420	C - 2	
			D194	D - 1	D421	C - 2	
			D195	D - 1	D422	C - 2	
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			D201	D - 1	D428	C - 2	
			D202	D - 1	D429	C - 2	
			D203	D - 1	D430	C - 2	
			D204	D - 1	D431	C - 2	
			D205	D - 1	D432	C - 2	
			D206	D - 1	D433	C - 2	
			D207	D - 1	D434	C - 2	
			D208	D - 1	D435	C - 2	
			D209	D - 1	D436	C - 2	
			D210	D - 1	D437	C - 2	
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			D212	D - 1	D439	C - 2	
			D213	D - 1	D440	C - 2	
			D214	D - 1	D441	C - 2	
			D215	D - 1	D442	C - 2	
			D216	D - 1	D443	C - 2	
			D217	D - 1	D444	C - 2	
			D218	D - 1	D445	C - 2	
			D219	D - 1	D446	C - 2	
			D220	D - 1	D447	C - 2	
			D221	D - 1	D448	C - 2	
			D222	D - 1	D449	C - 2	
			D223	D - 1	D450	C - 2	
			D224	D - 1	D451	C - 2	
			D225	D - 1	D452	C - 2	
			D226	D - 1	D453	C - 2	
			D227	D - 1	D454	C - 2	
			D228	D - 1	D455	C - 2	
			D229	D - 1	D456	C - 2	
			D230	D - 1	D457	C - 2	
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			D232	D - 1	D459	C - 2	
			D233	D - 1	D460		

**VM** [VM OUT]

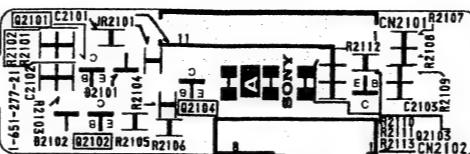
VM OUT

## PRINTED WIRING BOARDS

– VM Board –



- A2 Board -



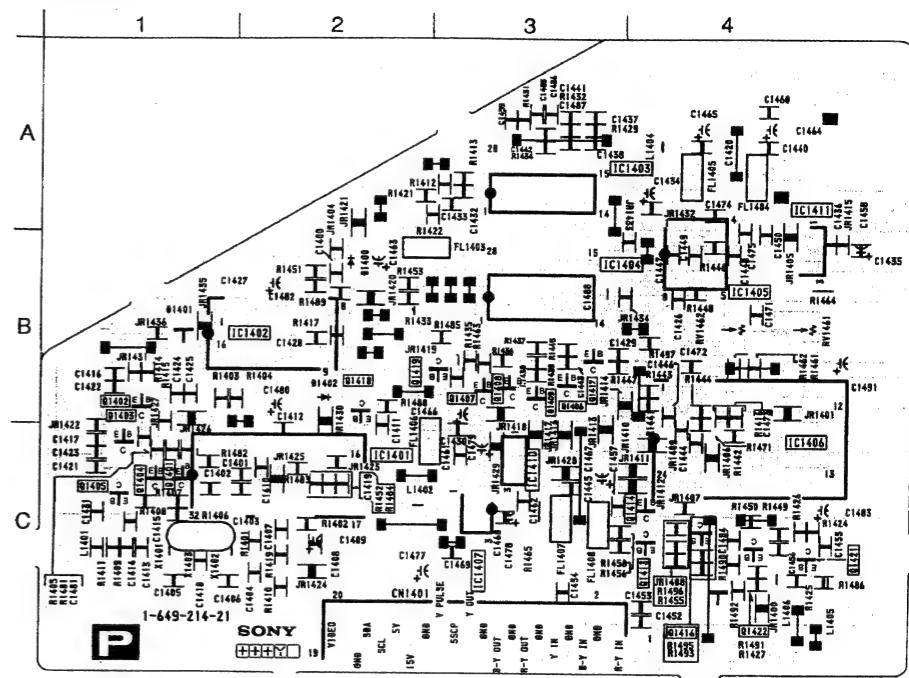
**A2** [ R, G, B IN/OUT,  
SCP IN/OUT ]

**A2** R. G. B IN/OUT,  
SCP IN/OUT

P IN P

PINE

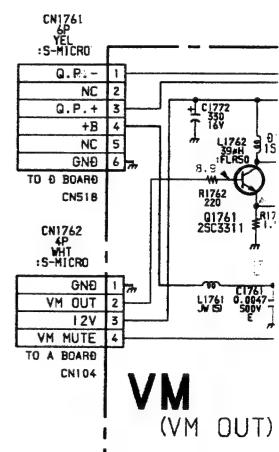
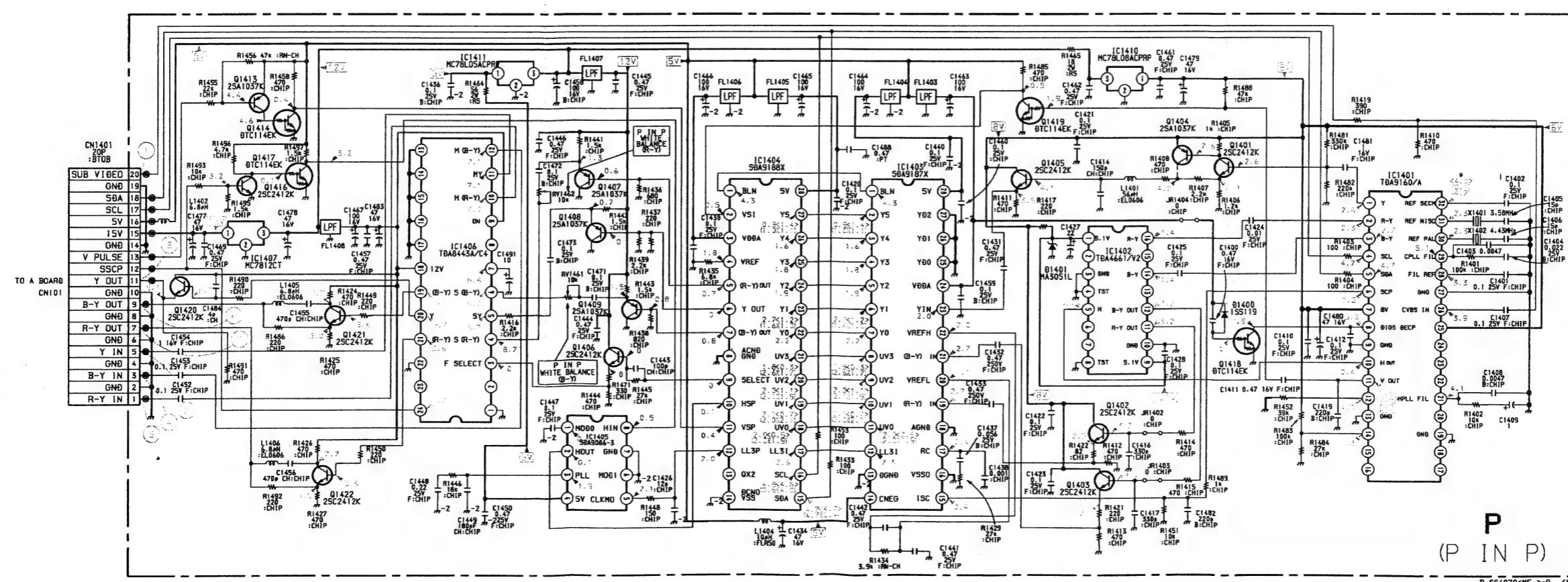
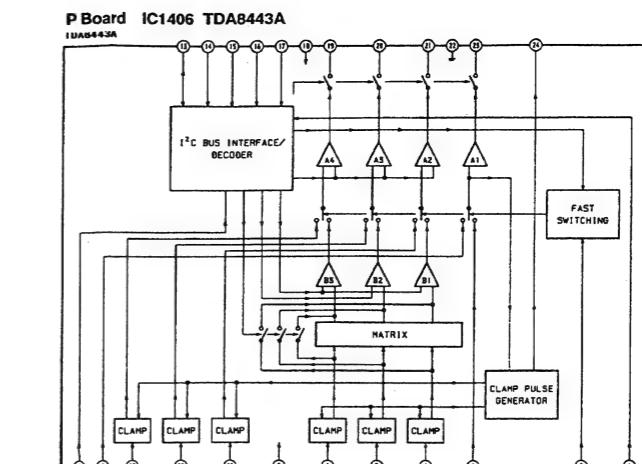
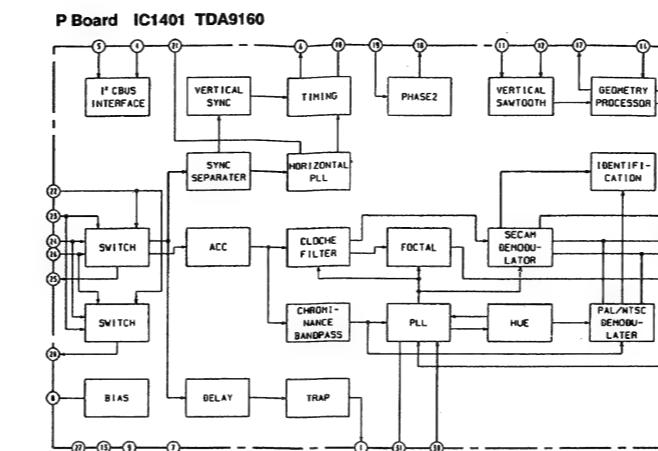
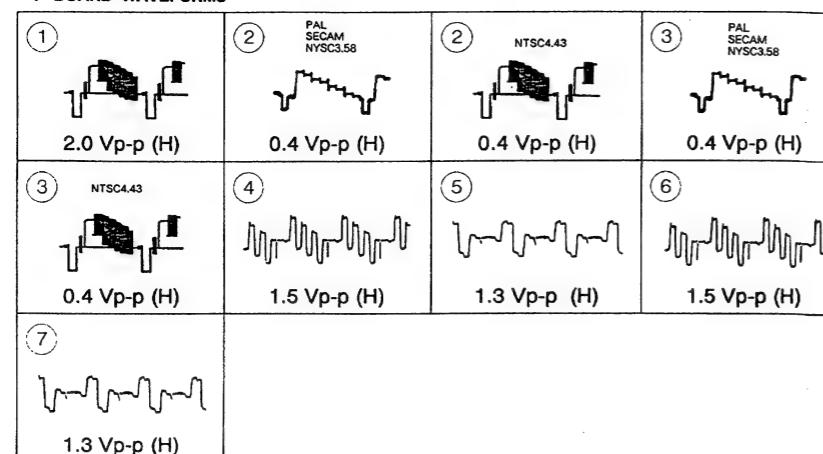
- P Board -



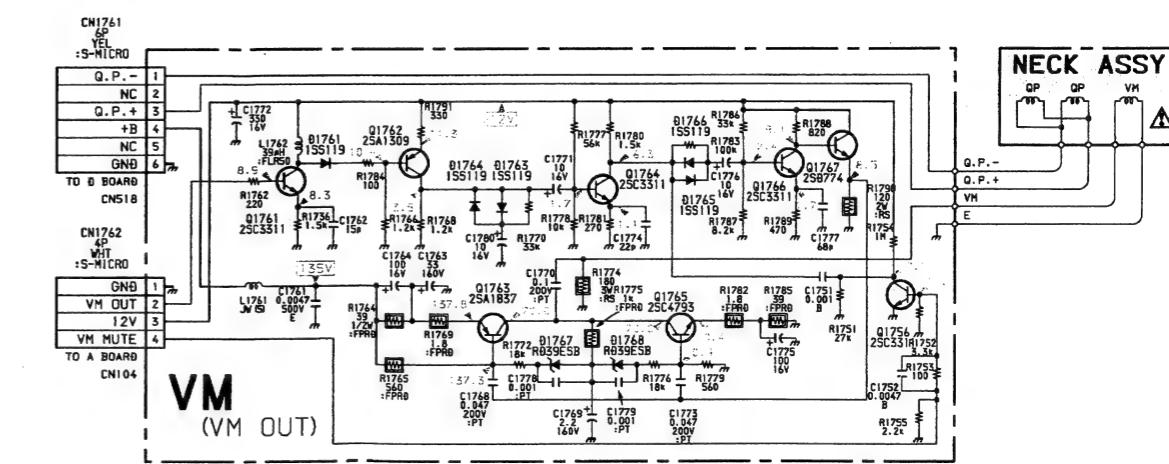
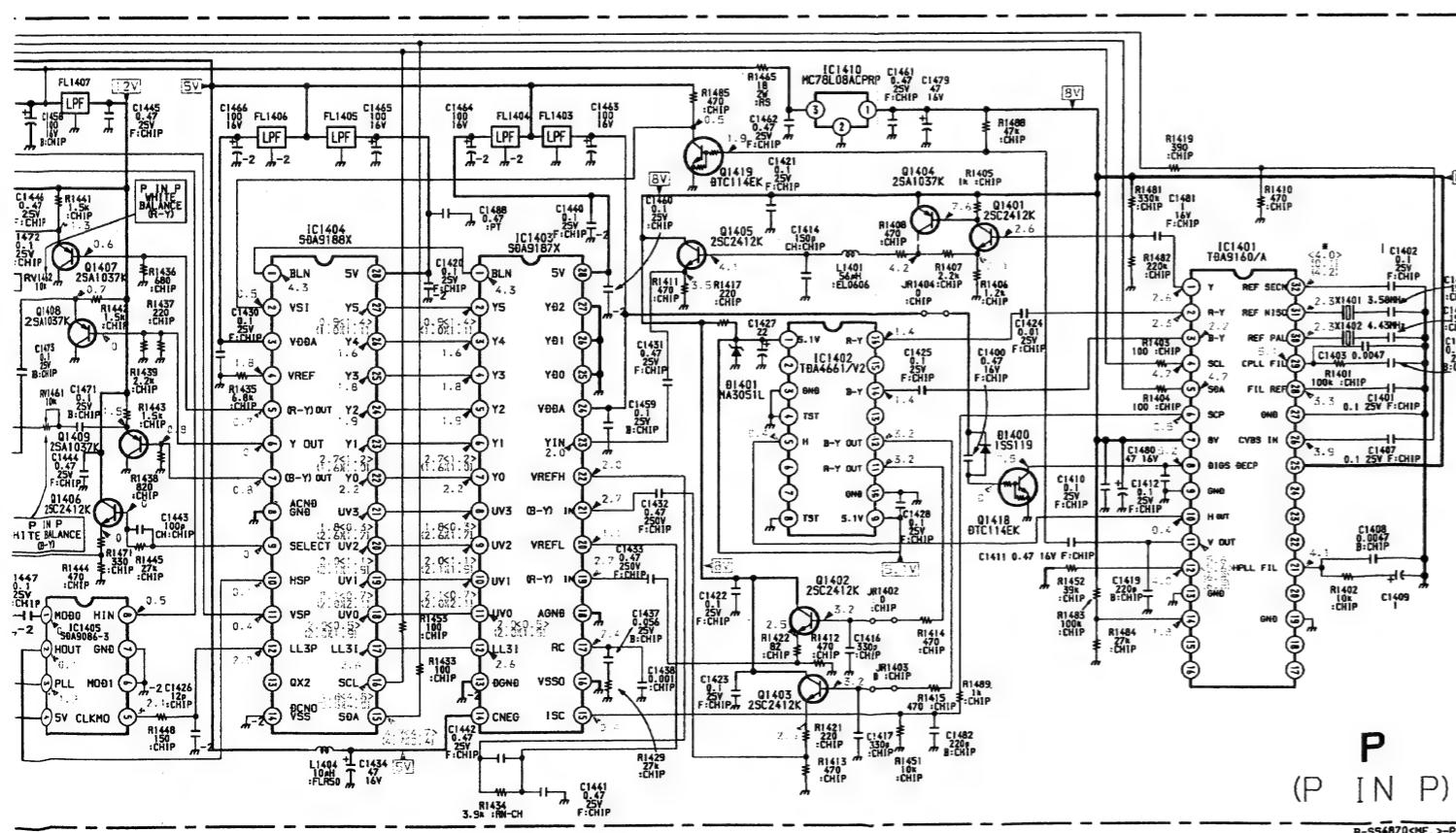
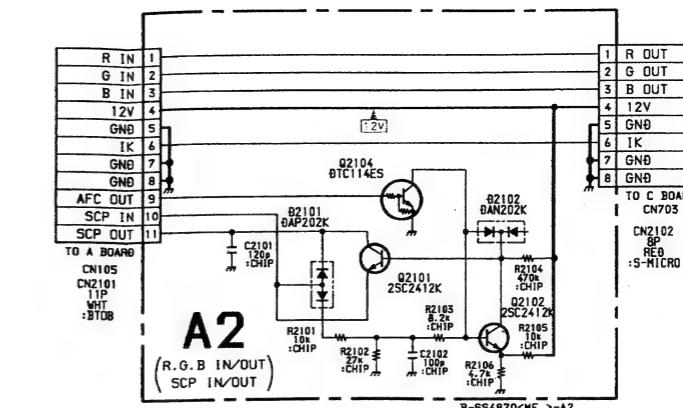
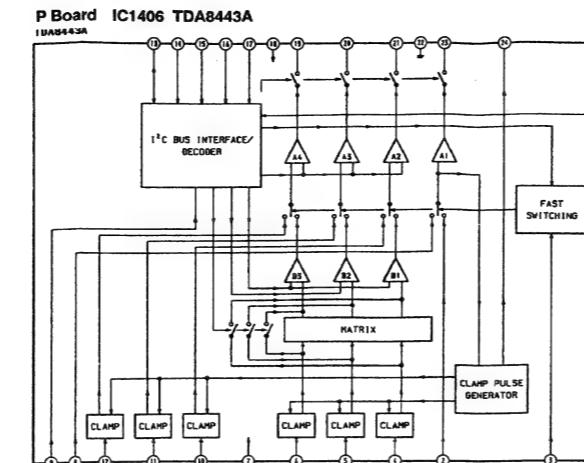
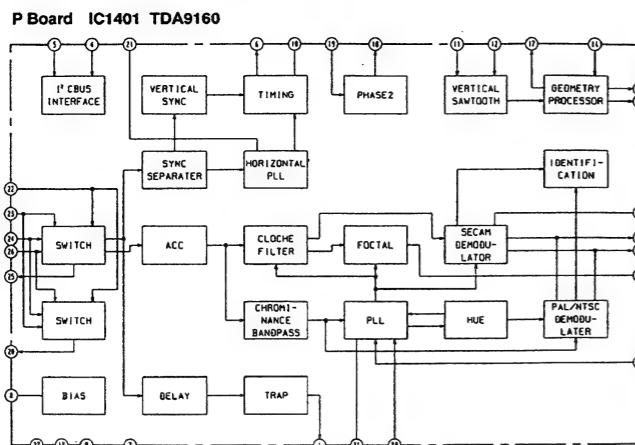
• P BOARD

IC	Q1403	C - 1	DIODE
IC1401	C - 2	Q1404	C - 1
IC1402	B - 2	Q1405	C - 1
IC1403	A - 3	Q1406	B - 3
IC1404	B - 3	Q1407	B - 3
IC1405	B - 4	Q1408	B - 3
IC1406	C - 4	Q1409	B - 3
IC1407	C - 3	Q1410	B - 3
IC1410	C - 3	Q1413	C - 4
IC1411	B - 4	Q1414	C - 4
TRANSISTOR		Q1416	C - 4
		Q1417	B - 3
		Q1418	B - 2
		Q1419	B - 3
		Q1420	
Q1401	C - 1	Q1421	C - 4
Q1402	B - 1	Q1422	C - 4
		CRYSTAL	
		X1401	C - 1
		X1402	C - 1

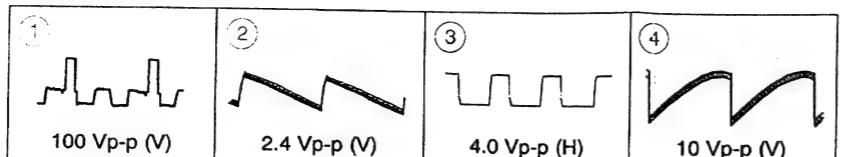
- P BOARD WAVEFORMS



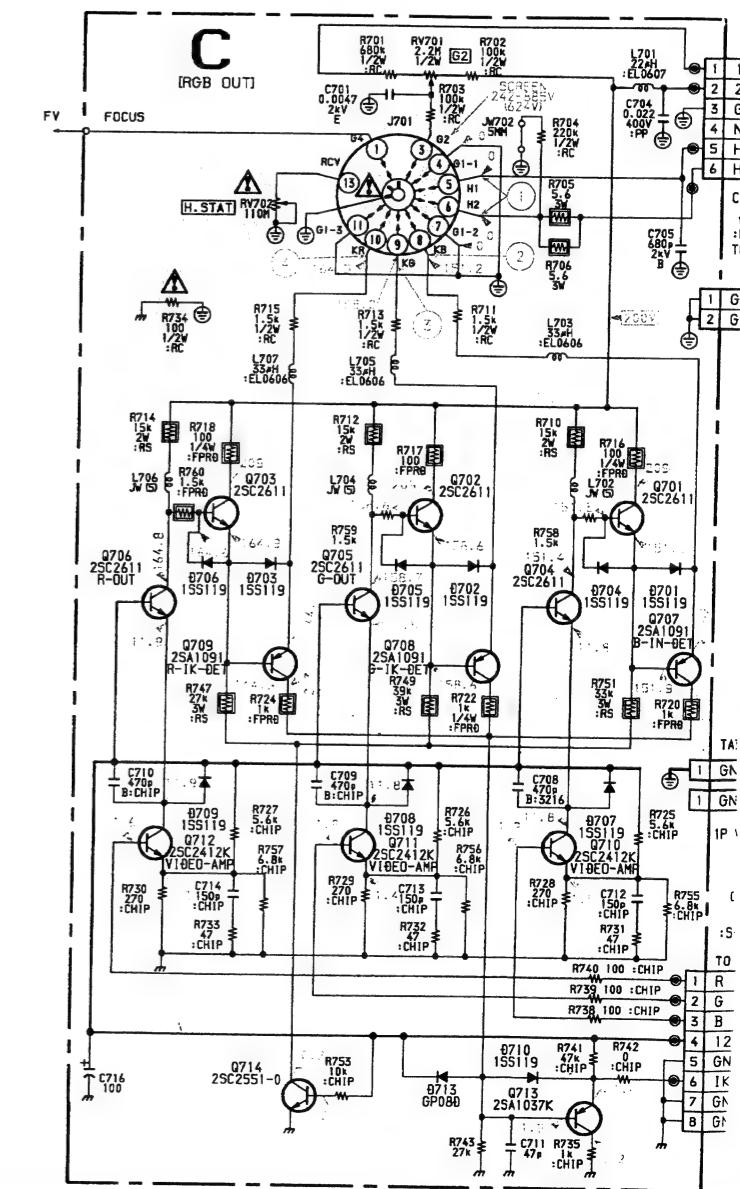
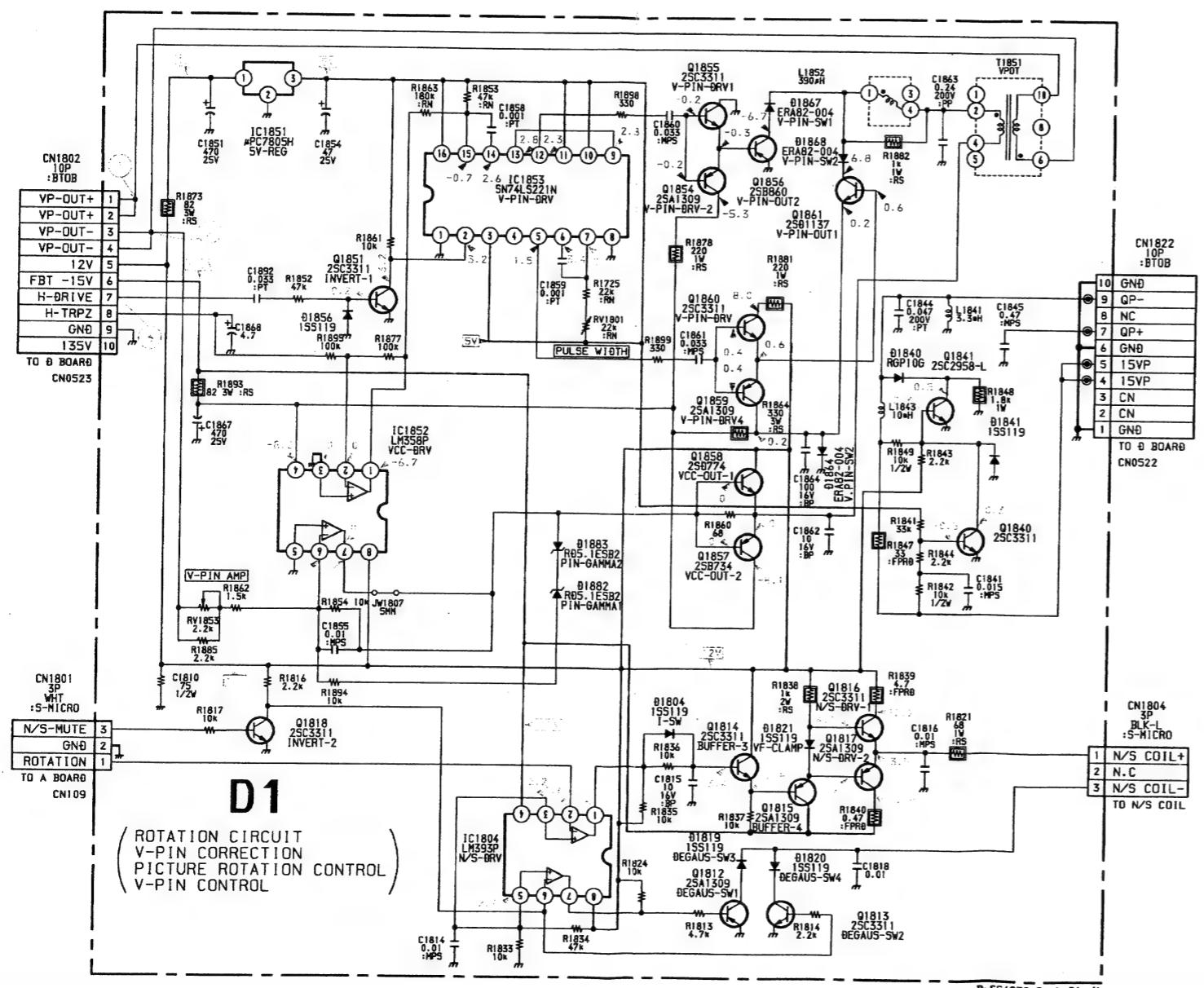
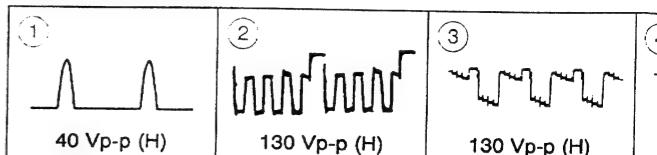
P  
(P IN P)

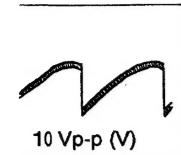


• D1 BOARD WAVEFORMS

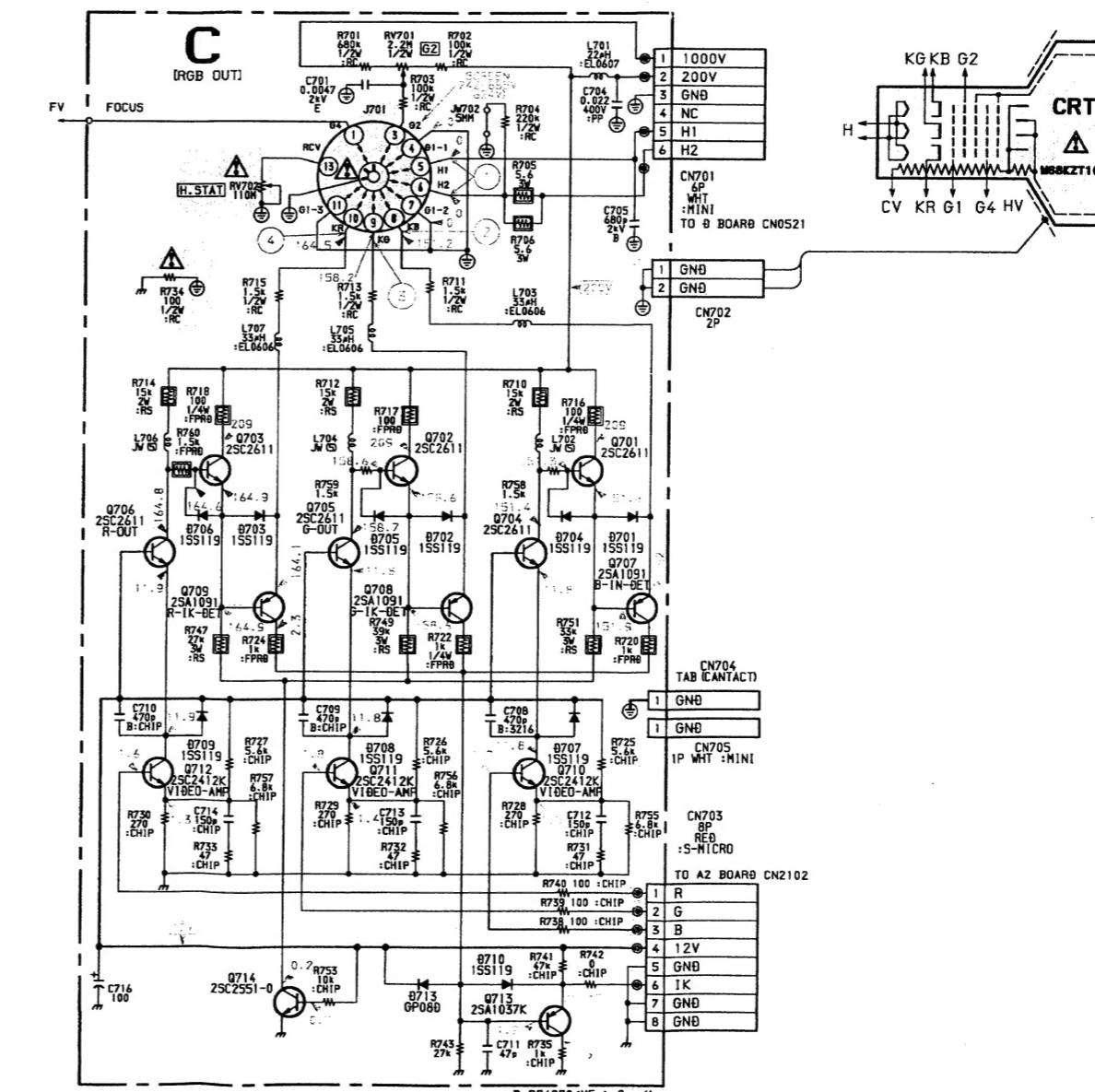
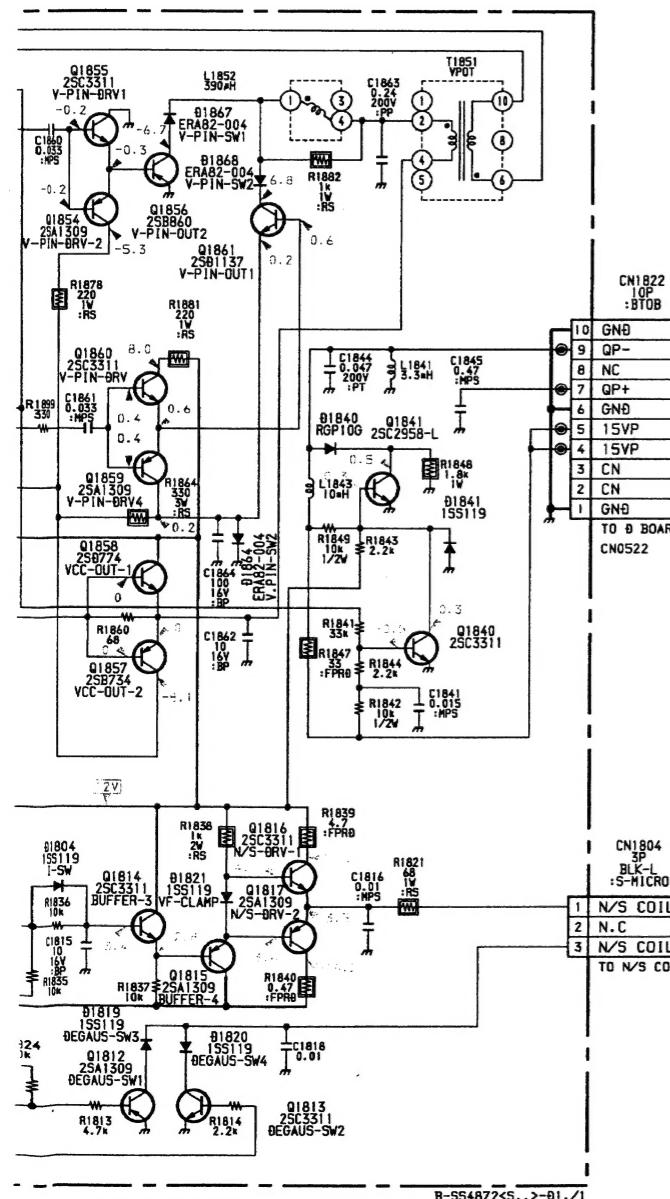
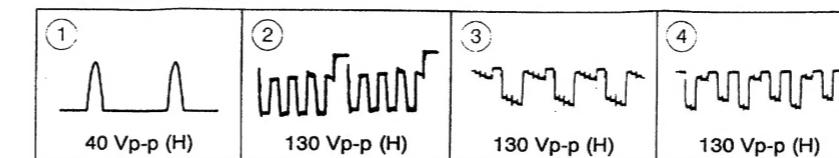


• C BOARD WAVEFORMS



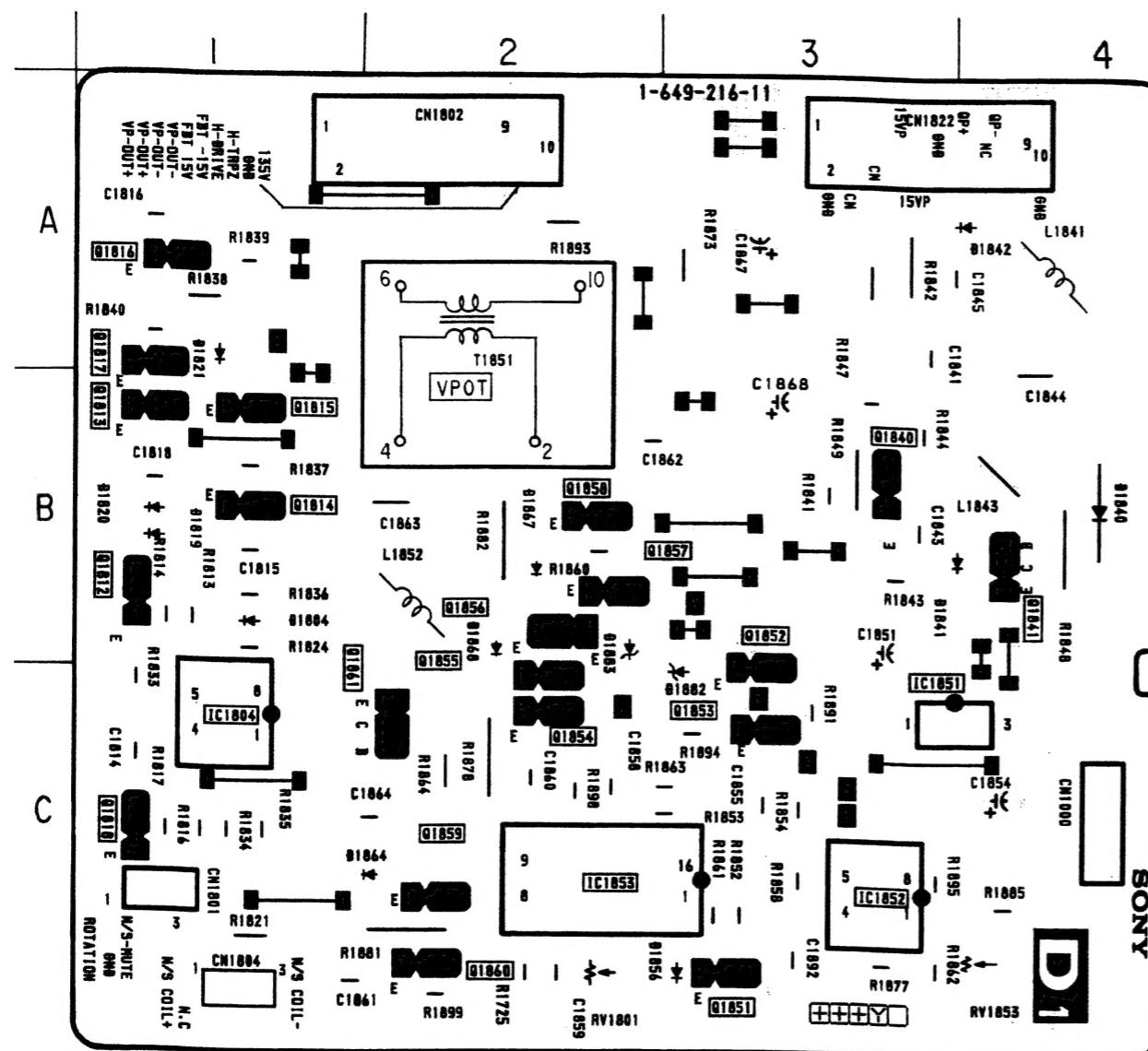


### • C BOARD WAVEFOR



## **PRINTED WIRING BOARDS**

– D1 Board –



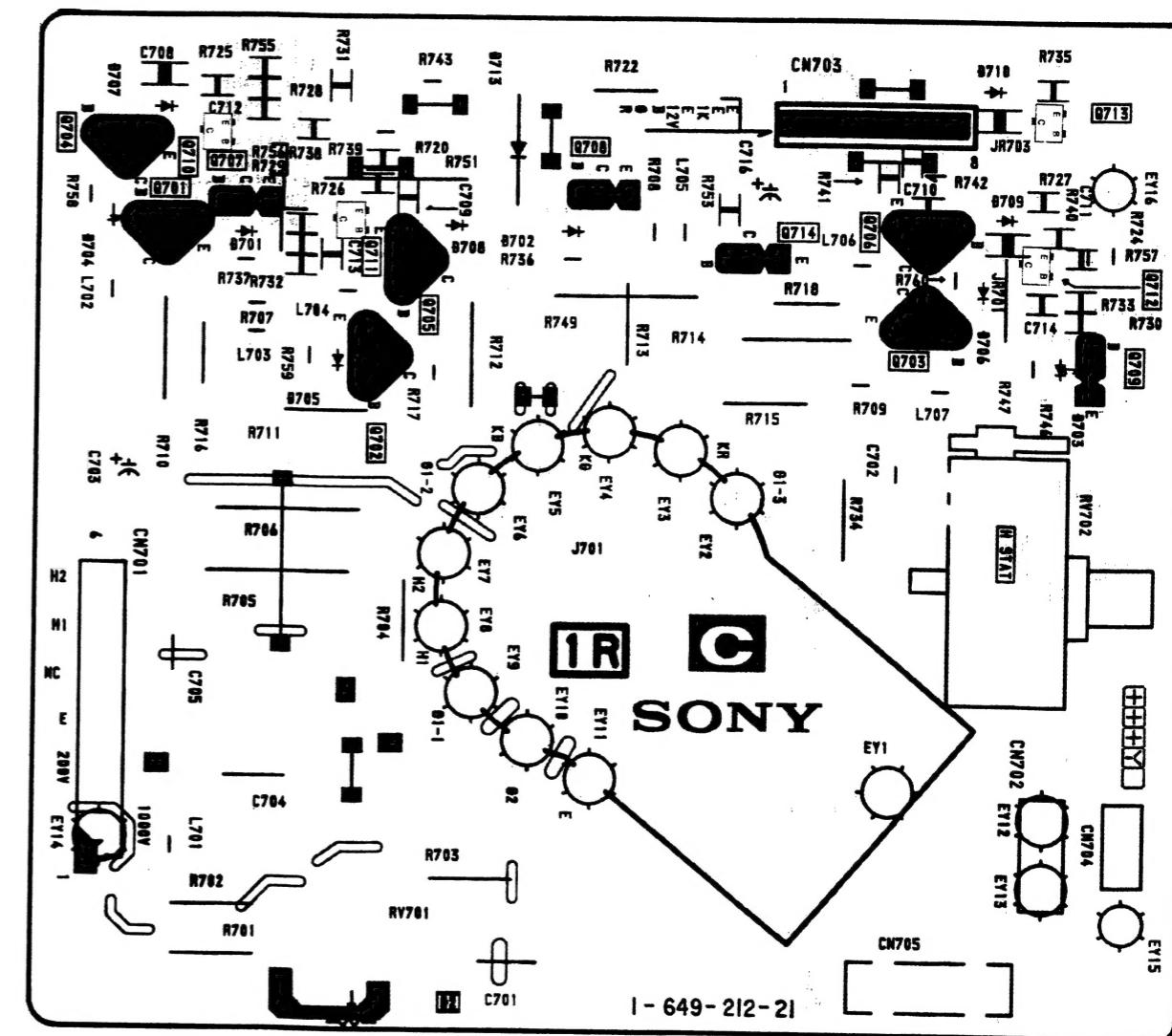
• D1 BOARD

IC	Q1851	C - 3	D1856	C - 3		
	Q1854	C - 2	D1864	C - 2		
IC1804	Q1855	C - 2	D1867	B - 2		
C - 1	Q1856	B - 2	D1868	B - 2		
IC1851	Q1857	B - 2	D1882	C - 3		
C - 3	Q1858	B - 2	D1883	B - 2		
IC1852	Q1859	C - 2	VARIABLE RESISTOR			
C - 3	Q1860	C - 2				
IC1853	Q1861	C - 2				
C - 2			RV1801	C - 2		
TRANSISTOR			RV1853			
Q1812	B - 1	DIODE				
Q1813	B - 1					
Q1814	B - 1					
Q1815	B - 1					
Q1816	A - 1					
Q1817	A - 1					
Q1818	C - 1					
Q1840	B - 3					
Q1841	B - 4					
	D1841	B - 3				

## D1 ROTATION CIRCUIT, V-PIN CORRECTION, PICTURE ROTATION CONTROL V-PIN CONTROL

**C** [R, G, B OUT]

– C Board –



**NOTE:**  
The circuit indicated as left contains high voltage of over 600 Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.



## 6-5. SEMICONDUCTORS

CAT24C04P

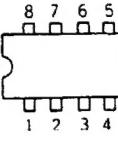
LM358P

LM393P

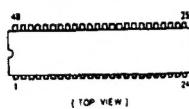
SDA9086-3

$\mu$ PC358C

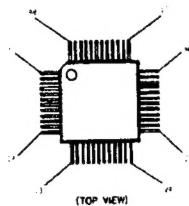
$\mu$ PC393C



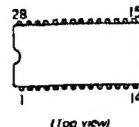
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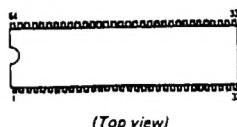
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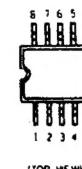
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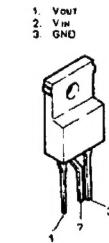
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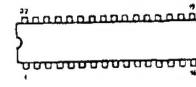
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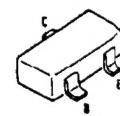
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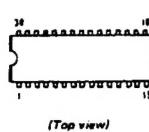
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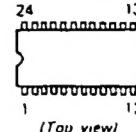
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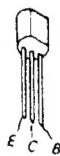
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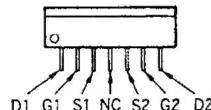
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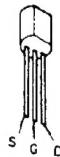
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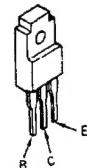


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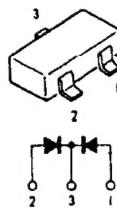
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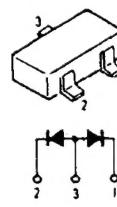
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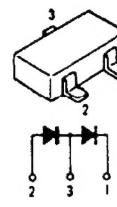
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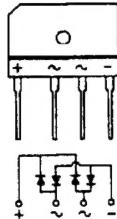
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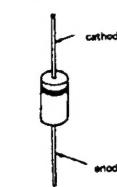
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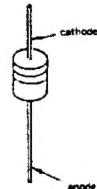


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EU-1Z  
EU-2  
GP08D  
RGP15G  
RGP15J

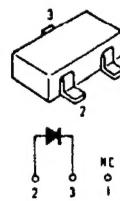


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RD3.6ES-B1  
RD33ES-B2  
RD39ES-B  
RD39ES-B2  
RD4.7ES-B2  
RD5.1ES-B  
RD5.1ES-B1  
RD5.6ES-B  
RD7.5ES-B  
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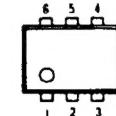
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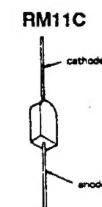
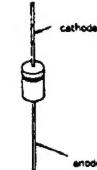
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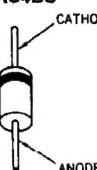
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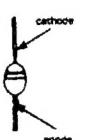
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ERD29-08J  
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RU4AM  
RU4DS



GP08  
U05Q



5P4M  
5P6M

